walking in the wissahickon with a bonsai man



Bebe Miles





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Photos of Zimmerman, Miles, Emerson, Bell, Sargent and Kistler by Priscilla Greentree

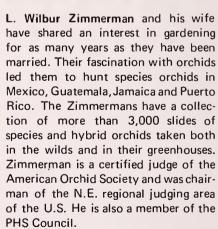
Here is the first issue of THE GREEN SCENE, and we hope you enjoy it as much as we have enjoyed putting it together.

Since the spring of 1971 when a feasibility committee reported favorably on the prospects of publishing this magazine, much has happened. The council gave the go-ahead and we formed a larger committee. We established general guidelines and policies. We selected an editor. And we assisted in the many planning details necessary to get THE GREEN SCENE underway.

The aim of THE GREEN SCENE is to meet the special needs and interests of the Delaware Valley and adjacent areas. We hope it will be useful and pleasing to those of you who have a green thumb and to those of you who would like to develop one.

We'd like to have your comments-pro and con. We want to be sure you'll be eager to receive THE GREEN SCENE and to read it as each future issue arrives at your home.

> L. Wilbur Zimmerman, Chairman



Bebe Miles is a gardener, a garden writer, a garden photographer and a garden lecturer. She authored the recently published Bluebells and Bittersweet, Gardening with Native American Plants and the earlier The Wonderful continued on page 19



It is with considerable pride and some trepidation that we present THE GREEN SCENE. We are proud that the Pennsylvania Horticultural Society is strong enough to undertake the publication of a magazine and proud, too, of the contents of this first number. But at the same time we feel a little apprehensive as we look down the road ahead with its constantly recurring editorial deadlines and inevitable financial challenges.

The purpose of THE GREEN SCENE is simple. The Society is devoted to the collection and dissemination of horticultural information and horticulture is essentially local. Our members probably have some curiosity about plants that grow in California or Maine, and they may have intellectual interest in plants that grow in Australia or South Africa, but their practical interest must center on the plants that will grow in the Delaware Valley. THE GREEN SCENE will give gardeners here, not only better information about which plants to grow and how to grow them, but also a better understanding of the horticulture of our region.

In this undertaking we are blessed with a number of advantages. There is no finer place in America to practice horticulture than the Delaware Valley; no other place in the country has a longer history of gardening; nor has a wider variety of parks, arboretums and horticultural institutions; and, above all, no editors ever started with such loyal and knowledgeable readers and contributors. It is our hope that THE GREEN SCENE will provide a means whereby the Pennsylvania Horticultural Society and its members can, in the words of our Charter, "foster the innocent and delightful enjoyment of horticulture."



Twate D Balland





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green scene

HORTICULTURE IN THE DELAWARE VALLEY

Volume I, Number 1

published by THE PENNSYLVANIA HORTICULTURAL SOCIETY 325 Walnut Street, Philadelphia, Pa.19106

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digging for information



Throughout the year we receive many letters here at PHS asking for help with horticultural problems. We thought it would be a good idea to share these questions and answers with you. If you have a different solution than any offered, and it has worked for you, let us hear from you.

by Ed Lindemann, horticulturist

I am at wit's end and do hope you can help me. I am a beginner in the field of raising house plants. Last October, I purchased a gardenia plant because it sounded like a challenge to grow. I've been to the Camden County Library and read all the books on house plants and have discovered that the authors of these books don't agree with one another when it comes to raising gardenias.

I've been very happy with my plant and don't want to dispose of it unless really necessary. Since Christmas, I've had four buds open and give off a beautiful fragrance. I've enclosed some samples of leaves from my plant. What are the causes of my problems and how can I cure them? The leaves that turn all yellow and then fall off have been appearing since December. The leaves with the little dry looking spots have been appearing since January, and the leaves that get completely brown and then fall off have been appearing for over a week. I would appreciate it very much if you would help me. . . . Last weekend I tested the soil and the pH is around 5.5. When I purchased this plant it was loaded with mealy bugs. I washed off the leaves with a fine spray of tepid water and then removed the bugs with a Q-tip dipped in alcohol. I then sprayed it with D-Con-House and Garden Spray. I've been washing the leaves once a month. I spray and then remove the mealy bugs only when necessary. Four weeks ago, I started using Isotox Systemic Granules, and haven't noticed any mealy bugs as of this

I fertilize my gardenia once a month with Stern's Mir-Acid. My home has 45% humidity. The plant is not in a drafty location nor near a heating register. I had it under the same conditions but in full sun (morning) until three weeks ago. It is still living under the same conditions except I have placed it in an area that is sunny (morning) but where the sun is not directly on the plant. I water it when the soil feels dry about an inch down. The pot it is in has drainage holes.

C.P., Voorhees, NJ

Don't be discouraged with your gardenia plant and don't dispose of it yet. The problems you've mentioned in your letter are quite common and have been experienced by most of us who have tried to keep gardenias as house plants.

The amount of humidity required by gardenia plants is much higher than that common to most houses during the

winter months. There are several things you might try to help raise the humidity. Place the pot or container in a saucer that has been filled with pebbles with just enough water to almost cover the pebbles. Be sure that the pot itself is not sitting directly in the water. You might also try a daily spraying with a fine mist of water over the foliage of the plant.

I suggest that you alternately use Mir-Acid and Miracle Gro to eliminate the possible danger of nutrient build-up. Fertilize once a month except for November and December when no fertilizing should be done.

Gardenias prefer a cool night temperature especially during the winter months. Place your plant in as cool an area as possible but out of drafts. A night temperature of 60-65 degrees is fine and day temperatures should not be much higher than 70 degrees.

Some leaf drop is normal for this time of year. Early spring is the time to give your plant a light pruning, that will help promote a more "bushy" plant.

Trial and error by experimenting with location, feeding, light, humidity and other factors are often the only way to find what is best for your plant in your particular house. This is the reason that different authors disagree on method.

Recently, I received Japanese lily seeds and as a member of the Society I would like to ask your advice on the procedure to follow in planting these seeds and caring for them afterward.

R.B.H., Bethlehem, PA

Your request for advice about planting Japanese lilies from seed can best be answered in the book LILIES, THEIR CULTURE AND MANAGEMENT, by Woodcock and Coutts (R. Macelhouse & Co. Ltd., Glasgow) which I've sent under separate cover from our library.

Editor's note: PHS members may borrow books by mail for a three-week period from our 12,000-volume horticultural library.

The North American Lily Society publishes a fine handbook on lily culture: LET'S GROW LILIES. For a copy send \$1.00 to Fred M. Abbey, Executive Secretary, NALS, North Ferrisburg, Vermont 05473 When I was down in Williamsburg, Va., last year I saw a plant called **crape myrtle.** I would like to buy the trees. I don't know which nursery or garden mart I would order the plant from in Virginia or in another area. If you can help me out on getting the address I would appreciate it.

R.J.L., Churchville, PA

The crape myrtle (Lagerstromia indica) is not hardy in our zone and, therefore, is not usually found in local nurseries or garden centers.

There are a few people in the Philadelphia area who have been successful in their attempts to grow crape myrtle. Enclosed is a list of some nurseries in Pennsylvania and Virginia that you might contact.

I would like to know what kinds of trees the gypsy moth destroys. I am getting ready to plant a couple of shade trees. Would silver maple be one? Also, what kind of shade trees grow fast?

A.W., Philadelphia, PA

The gypsy moth can be found anywhere in the Delaware Valley area and on almost every type of shade tree. Oak trees seem to be a favorite of the gypsy moth; however, I would not let this stop me from growing oaks as shade trees.

Here is a list of rapid-growing shade trees. The silver maple that you mentioned is not recommended as a shade tree and I would not advise you plant them.

RAPID-GROWING SHADE TREES

Common Name **Botanical Name** Chinese elm Ulmus parvifolia Green ash Fraxinus pennsylvanica lanceolata Thornless honey locust Gleditsia triacanthos inermis varieties Sycamore Platanus occidentalis Little-leaf linden Tilia cordata Japanese poplar Populus Maximowiczii Sugar maple Acer saccharum Red oak Quercus borealis Scarlet oak Quercus coccinea

Will you please advise me as to which vines and flowering plants would be good to use on a balcony located on the northeast corner of a high-rise apartment building.

Zelkova serrata

J.K.S., Philadelphia, PA

I have sent you under separate cover a copy of THE CITY GARDENER by Philip Truex from the PHS library. I have read portions of this particular book and have found it very informative.

Editor's note: The Philadelphia Flower & Garden Show has been featuring several apartment balconies as entries in the competitive classes. This class will again be included in the 1973 Show, and high-rise dwellers are invited to come and to take notes.

I have African violets which seem very healthy. That is, they have beautiful leaves. However, they do not bloom. Can you tell me the possible reason or refer me to a source that can? Also, how often do normal violets bloom each year and for how long?

L.D.H., Philadelphia, PA

African violets require good, strong light, a temperature of 65-75 degrees and high humidity of 50-70% in order to bloom. To water, use only warm water and water only when the soil begins to dry at the top. Use a well balanced fertilizer and carefully follow the manufacturer's directions. Do not overfertilize.

African violets should not be grown in too large a pot. Use a pot that is adequate for the size of the plant. Repot only when the soil is filled with fine roots.

I would appreciate it very much if you could forward to me any information you may have on the care of Rechsteineria cardinalis.

C.S.S., Huntington Valley, PA

These South American plants are grown for their summer flowers. They require a lot of light and are best suited for a west window. Water moderately and feed biweekly during growth. As with most house plants, they require a great deal of humidity, at least 50%. After the plants have bloomed, leave the tubers in the pots and store in a dry, dim place that is quite cool. After a rest of three or four months, new growth will show and they may be repotted for the next season. New plants may be started from either seeds or cuttings. *Rechsteineria* does not do well outside and for this reason is best kept in the house during the entire year.

Please tell me what is causing my Christmas cactus to droop and look sick. I discovered tiny, flat oval things on the underside of some leaves. They do not move or wiggle. I sprayed with very dilute malathion and it seems to have helped but now I hear that malathion is listed among the taboo insecticides. What do you recommend?

Also my Oxalis is ailing. I suspect tiny white flies. Mrs. J.S.B., Chester Heights, PA

From your letter it is very difficult to tell exactly what is wrong with your Christmas cactus. It would be best if you send us a portion of the plant showing the problem area. With a specimen we will be better able to determine the problem and offer a cure. Malathion is not listed among the taboo insecticides; it is highly recommended.

In reference to the white fly problem on your Oxalis, again malathion is an excellent treatment for white flies. It would be best, however, to check the label or test an individual leaf first to make sure it will not cause browning.

Editor's note: PHS will help you with any plant problems including pests, diseases, environment or identification if you will get in touch with us before sending samples. We will send you a form that should be completed and returned with your sample.

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Japanese Zelkova

The Cooperative Extension Service of Pennsylvania State University, the University of Delaware and Rutgers, the State University of New Jersey, probably have an office in your county with a staff of county agents and home economists to give you free, unbiased, up-to-date information in the broad fields of agriculture and home economics.

From the Extension Office you can obtain information on flower and vegetable gardening; your lawn; soil testing, liming and fertilizing; insect and disease identification and control; home fruit management; planting and care of shrubs and trees, safe use of pesticides and many other subjects. Copies of university publications (bulletins, leaflets and mimeographs) are available free for the asking.

The county agent is an expert with technical training and experience in the conditions and problems of the Delaware Valley. His job is to answer your questions and give you helpful advice. When he is stumped, he can call upon a corps of specialists at his State University.

4-H Club work for young people ages 8-19 is also part of the Cooperative Extension Program. There may already be a club in your community. You can find out by calling the Extension Office. To start a 4-H Club you should have 10 or more members (boys, girls or both) and a volunteer adult leader. Club members choose their own project and decide how often to meet and where meetings will be held. A partial list of projects in gardening includes: Annuals and Perennials, Growing Cut Flowers, Lawn Management, Strawberries, Vegetable Gardening, Landscaping and Indoor Gardening.

Each county agent holds meetings for homeowners on subjects of interest to the amateur gardener. In addition, since 1961, the agents in Bucks, Delaware, Chester, Montgomery and Philadelphia Counties have conducted meetings for nurserymen, greenhouse operators, garden supply dealers, landscape contractors, tree surgeons and building and grounds superintendents.

Your county agent is as close as your telephone. Or you can stop at the Penn State Extension Service booth at the Philadelphia Flower & Garden Show and get acquainted. Following is a listing of the addresses and telephone numbers of the agents operating in or near the Delaware Valley.

COUNTY	AGENT	ADDRESS	PHONE
Bucks	Richard A. Bailey	Neshaminy Manor Center Doylestown, PA 18901	215-DI 3-2800
Chester	Robert A. Powers, Jr.	Court House North Wing West Chester, PA 19380	215-696-3500
Delaware	James J. McKeehen	Toal Building Media, PA 19063	215-LO 6-0142
Montgomery	Joseph H. Way	400 Markley Street Norristown, PA 19401	215-277-0574
Philadelphia	William H. White	S.E. Cor. Broad & Grange Sts. Philadelphia, PA 19141	215-HA 4-0650
Burlington	Richard L. Washer	County Office Bldg. 49 Rancocas Road Mt. Holly, NJ 08060	609-267-3300
Camden	Robert G. Ruizzo	County Extension Service Bldg. 152 Ohio Avenue Clementon, NJ 08021	609-784-1001
Gloucester	Robert W. Langlois	County Office Bldg. N. Delsea Drive Clayton, NJ 08312	609-881-1200
Mercer	Albert Neuberger	930 Spruce Street Trenton, NJ 08638	609-396-4593
Salem	Ivan H. Crouse	County Administration Bldg. 94 Market Street Salem, NJ 08079	609-935-1360
New Castle	David V. Tatnall	University of Delaware Newark, DE 19711	302-738-2506
Kent	Francis Webb	Box 340 Dover, DE 19901	302-736-1448
Sussex	William H. Henderson	R.D. 2-Box 48 Substation Building Georgetown, DE 19947	302-856-2553

There must be hundreds of entrances to the Wissahickon Valley. These include the many informal paths and trails, as well as the 25 more formal entrances.* The entrance on Crefeld Street is one of my favorites. You turn in between two pillars and step out of the suburban world of Chestnut Hill into one of the finest groves of tulip poplars in Fairmount Park. The path drops away to the right in a welcoming curve along the side of a hill. In the winter it always makes me wish I had a pair of skis to slide down the gentle slope into the trees.

I suppose one reason I like this spot is that I like tulip poplars. They are much maligned trees. Of course they are not as noble as the blighted chestnuts and logged-out oaks they have replaced. But the tulip poplars have the tallest, slimmest trunks in this region. In a grove like this their slender lines will carry your eye irresistibly upward from the jack-in-the-pulpits on the ground to the canopy of foliage seventy feet or more above.

Halfway down the hill we come to a fork in the path typical of Wissahickon walks. By my rough estimate, thirty-five miles of trails run along both sides of the Wissahickon Creek from the park entrance at Northwestern Avenue to the Lincoln Drive intersection. They twist and turn along the steep banks of the creek and its tributaries with innumerable connecting links. When you get to know the lay of the land, you can combine and recombine the trails in endless variety.

If we took the path to the right, we would pass between two huge poplars and would then move over the brow of the hill into an entirely different environment on its north side. There we would see beech trees yielding to hemlocks in an abrupt transition as the exposure changes from northwest to north. Under the beeches and the older hemlocks is an almost bare forest floor, dotted with laurel. If you question why laurel is our state flower, the many slopes like this in the Wissahickon will

give you the answer.

Much as I enjoy that particular laurel slope, let's turn the other way today. As we come around the bend, our path joins an old road along a stream starting above Chestnut Avenue and running down to the Wissahickon. The cartway has almost disappeared; but if you look closely along the side of the path near the stream, you can see the old stone work, and near the bottom, on the far side, there are the remnants of the abutment of a bridge or dam.

Stone work is part of the Wissahickon. You find it in old roads like this one, in the dams and foundations of the old mills, in bridges, and in the retaining walls and steps built when the Fairmount Park Commission took over the valley about a hundred years ago.

Where did the stones come from? I suppose some were picked up on the site, but most were quarried in small open pits along the route. Here's one of the pits on our left where our path joins the old road. Trees and shrubs have taken over the raw rock faces in these pits. In this particular one, if you look up along the rim, you will spot three or four large trees growing out of cracks in the rock, their roots spreading along the crevices like drippings along the side of a candle.

At this point I should confess that I am a root and rock nut. Of all the things to see along the Wissahickon, my eye turns most often to the weathered rocks with their mosses, ferns and lichens, and to the roots of the old trees clasping the rocks and twining among them. There's no mystery as to why I like roots and rocks. My horticultural hobby is bonsai, so I see the Wissahickon as a collection of full-scale prototypes for my miniatures.

Come to think of it, I suppose everyone views the Wissahickon against the background of his own interests. A true horticulturist sees not only showy things like the marsh marigolds in this stream, but also shy plants like the trailing arbutus that grow on the west-

Frederic L. Ballard is a lawyer who loves gardening and who particularly enjoys bonsai. He is a past president of the Pennsylvania Bonsai Society and has been responsible for staging a number of bonsai exhibits at the Philadelphia Flower & Garden Show. He has lived all of his life on the boundaries of the Wissahickon.

My dog Shawn and I walk along one of the rock outcrops that dot the Wissahickon Gorge. This one happens to be a popular spot for picnics, tete-a-tete.



walking in the wissahickon with a bonsai man



The tulip poplars have the tallest, slimmest trunks in this region.

I am a root and rock nut.



ern banks of the higher paths. For geologists, the cliffs along this ancient stream and the rocks lying in its bed tell a story that started before the heights of Chestnut Hill and Roxborough thrust up out of the plain. If you are interested in history or archeology, you will enjoy exploring the old mills, dams and roads and the terraces that, I am told, are the remains of vineyards. Architects will find along the rim of the park a fascinating array of houses designed for gracious living over the past hundred years. There are birds for bird watchers; raccoons, woodchucks and squirrels for zoologists; a surprising variety of micro-climates for ecologists; and a few fish for fishermen. There are even rock faces for mountain climbers, and it's always fun to watch them work their way up fifty or sixty feet of vertical cliff with full alpine equipment.

Enough digression . . . back to our walk.

Here at the bottom of the hill there is a lovely place where the stream runs through a series of rock flumes and spills out over a broad shoulder into a waterfall. The scale is small, but the effect is for all the world like Yosemite in springtime. And if you look up to the brow of the hill on the far side, you will see one of the rock outcrops that dot the Wissahickon Gorge. That one happens to be a popular spot for picnics, tete-a-tete.

Again a fork in the path. Shall we turn left or right? If we turned right, we would pass the pool at the foot of the waterfall. My dog cools her feet there, and in hot weather solemnly puts her nose under the water to cool as well. Beyond the pool we would see some fine beech trees and a stand of native ginger which will explain why this plant rates a place in ground cover catalogues. But on the whole, I think we'll do better to turn left. We can pick our way along the side of the main stream under one of the steepest continued

*Wissahickon Creek rises northwest of Philadelphia and joins the Schuylkill below Manayunk. For the last seven or eight miles of its course it flows through a wooded gorge that is included in Fairmount Park. Readers who would like to retrace the author's path along a section of this gorge will find the starting place on the south side of Crefeld Street, a few hundred feet west of its intersection with Norman Lane in Chestnut Hill. Maps of the Wissahickon trails are available at Valley Green Inn on the Wissahickon, Willow Grove Avenue and Huron Street, Philadelphia, PA 19118.



The stream runs through a series of rock flumes. The scale is small, but the effect is for all the world like Yosemite in springtime.

banks in this section of the park. In the winter, icicles form where the water drips out of the rock wall on our left. At first it's picturesque, but as the ice builds up across the trail, you have to abandon this route and take another path halfway up the slope.

A few years ago I would have called this spot the jewel of the Wissahickon. The hill was heavily wooded with mature hemlocks and under them was a carpet of moss broken only by rocks. The north exposure and the hemlock foliage made it too dark for other plants to compete with the moss, and the fifty degree slope encouraged fallen twigs and hemlock needles to wash down into the stream, so that the moss always looked freshly groomed. No Japanese moss garden could have been lovelier.

I use the past tense advisedly. The hillside is still beautiful, and there are still some fine examples of the way a hemlock can pour its roots over a rock ledge. But half the hemlocks are dead, and broad-leaved seedlings are springing up out of the moss where fallen trees have left holes in the canopy. The explanation is a classic dilemma. The hemlocks died from scale disease—



Our path joins an old road along a stream starting above Chestnut Avenue and running down to the Wissahickon.

which might have been prevented by repeated spraying with Cygon. However, the public was against it, because Cygon kills the birds.

But enough of such troubling thoughts. We are coming to one of the most photographed places in the valley, the red covered bridge at the bottom of Thomas Mill Road, When I bring my Parkway School seminar students here, we pause to debate how the trusses work and why it pays to cover the structure with a roof and sides. We discuss, too, how a bridge buff can place the age of this bridge almost to the decade by its wrought iron tie bars, which were used only for a short period just before the Civil War. I point out that all of us can thank the depression of the 1930's for the fact that the bridge is still here. It was extensively rebuilt by men on WPA, who also built the new trails and repaired many old

Just above the bridge is a fine old dam and mill race, and below it on the right bank is a stone arch carrying the carriage road across a tributary creek. But I needn't dwell on their aesthetics; they tell their story to anyone who looks at them.

And now, when we cross the bridge, we come to the carriage drive along the Wissahickon, which forms the spine of the park. The road is worth a moment's reflection. It's a perfect example of waterbound macadam construction, the ingenious design of John Loudon McAdam. Constructed laboriously as a toll road between 1836 and 1856, it was taken over for park use just about a hundred years ago. Today, we would be more apt to let a toll road take over park land than the reverse. Nor do we often have the confidence to build for the centuries.

Once more the choice between right and left. We could turn right and head up the hill on the opposite arm of Thomas Mill Road, a very old cartway that used to lead down to the mill. This would take us to the high country, fields of native grass that turn russet in the fall and retain that color until spring. Scattered through the open spaces are clumps of sumac, birch and sassafras, with occasional mature sassafras and oaks all filled with birds.

These fields are particularly lovely in the snow or by moonlight. The combination, a moonlit night when the snow is on the ground, surpasses any-



The hillside is still beautiful, but many of the hemlocks are dead.

thing else the park has to offer. As a matter of fact, moonlight walks are not confined to the open spaces. The main drive is lighted, and once you know the trails, you can walk on any of them by moonlight in the winter (in the summer the leafy canopy cuts off too much light). That's when you feel most strongly the upward thrust of the trees into the sky.

It would be fun for us to go up into this open country and over the hill to the slope along Bells Mill Road, where we would see a different kind of moss carpet and a fine stand of laurel. Also, some tremendous chestnut stumps and logs, to tell us what it was like before the blight. Indeed, I think every walk should include some of the high trails as well as those along the water's edge. But it's getting on and we should be heading back to Chestnut Hill.

So we'll skip the high country this time, turn left and head down the carriage drive for the Rex Avenue bridge. Keep your eyes open. This is an interesting stretch.

Up above us on the right is a bonsai man's dream—a clump of trees growing out of a rock outcrop (a bonsai book would call it a group planting, root-



The high country takes you into fields of native grass that turns russet in the fall and retains that color until spring.

over-rock style) and a fine stand of ferns covering the top of the outcrop and pouring down the sides. Further along there's a group of beeches with an intricate network of exposed roots (another bonsai feature), and the traces of an old path leading to a rockslide capped by one of the most formidable outcrops of all. Then comes a heavy stand of hemlocks—healthy ones—growing out of a romantic tangle of dripping, moss-covered rocks and clumps of ferns. All along the way you can see seedlings in crevices, each setting out bravely to become the king of the forest.

The Rex Avenue bridge is another spot of interest. Above it, high on the left bank of the stream, sits the granite statue of Chief Tedyuscung watching his people move westward to make way for the white man. Almost directly below him you can see a picturesque rock wall with a miniature gravel beach along the stream. Opposite the near end of the bridge is the site of one of the inns set up along the toll road before it became park. And just below the bridge is a log cabin, used by the park guards, which was built by the WPA. Anyone can see that it's beautifully constructed, but it was not until

I read the Foxfire Book* that I realized that its overhanging dovetail notches represent the ultimate in log cabin craftsmanship.

Now for the long climb up Rex Avenue to its intersection with Seminole near the top of Chestnut Hill. When we get there, we will be only a few blocks from where we started, and about the same distance from the Chestnut Hill trolley loop and commuter stations.

As always, we'll be passing temptations along the way. The lower path on our right is one of the most beautiful in the entire valley. The upper path on the same side runs along below a series of interesting houses—and incidentally provides a view of a huge beech tree with spreading roots and spreading branches in the classic vase shape, enough to take a bonsai grower's breath away. On the other side the paths lead to Tedyuscung and beyond him to . . .

But we have rambled enough for one day. Tomorrow, or next week, we can take another walk over different paths. Next month we can retrace today's walk and it will seem entirely different. That's the fascination of the Wissahickon.

One of the wonderful advantages of gardening in the Delaware Valley is the vagary of its spring weather. That may not seem like much of a big deal when frost nips early transplants. But the very changeability makes possible a parade of tulips that can be stretched to nearly three full months of bloom hereabouts.

Bebe Miles wrote Bluebells and Bittersweet: Gardening with Native American Plants, Van Nostrand Reinhold, 1970, and The Wonderful World of Bulbs, Van Nostrand, 1963. Garden photography and lecturing as well as her work on the board of the Doylestown Nature Club and as an officer of the Bowman's Hill Wildflower Preserve show Ms. Miles's commitment to the world of horticulture.

PROLONGING TULIP TIME: stretching color

by Bebe Miles

Which three months you will get blooms depends somewhat on where you live. Here at Doylestown I expect my first tulips in March and my last in June. Adjust your expectations for next spring accordingly if you live north or south of Doylestown.

Knowing what kinds to plant where is the trick to prolonging tulip time. You automatically gain extra weeks by choosing different species and hybrids and planting them in the right spot. Basically the sequence of bloom will be the same no matter when it starts.

Let's consider first the earliest bloom. For these tulips select a warm, well-drained niche. At the foot of a south-facing wall, to the sunniest side of a bush or evergreen or on the south side of the house, any place where the snow always melts first. This siting advances bulb bloom at least a week.

In such a miniature southern resort an established planting of *T. pulchella violacea* in my garden showed its first color this year on St. Patrick's day. It is a vibrant reddish-purple hue that quite knocks your eye out after the grey days of winter. Moreover the

glossy, glove-shaped flowers are of substantial size. You may find this superb tulip opener cataloged as *T. p.* Violet Queen.

For companions to the Violet Queen add some ordinary snowdrops (*Galanthus nivalis*) or an early white crocus like *C. biflorus* White Lady. Such a planting deserves a spot where you will see it frequently for the lift it imparts to the spirit.

Closely related to the Violet Queen is another early bird which may be listed either as *T. pulchella* or *T. humilis.* It bears charming little violet-pink stars with a yellow base. Unlike its more flamboyant cousin, it will be overlooked since it is only four inches high unless you give it a prominent spot and plant the bulbs closely together.

Toward the end of March, I anticipate one of my all-time favorites, *T. turkestanica*, in a sheltered spot. Olive drab outside, its petals open whenever the sun shines to form cheerful white stars with golden centers. Since there are often eight or more flowers per stem, it makes a good show even though the individual flowers are only about



Close-up of early *T. turkestanica* shows branching habit. photography by Bebe Miles

an inch wide. They combine nicely with bright blue chionodoxa blossoms which are out at the same time. *T. biflora* is much similar but not as floriferous.

These very first tulips are definitely "wild" in the sense that we are planting the same species originally found in the lands of the Near East. Our next grouping, however, is really a whole collection, many of them hybrids bred in recent decades.

No early spring garden should be without some examples of *T. kaufmanniana*, but I would caution you to plant these always in groups of a single variety rather than in mixtures. Colors and bloom times vary considerably among them, and the so-called "Peacock mixtures" are aesthetically often disappointing.

First to bloom, again often in March, is the type *T. kaufmanniana* or its selection named The First. Both have three rosy-red outside petals and are extremely slender in bud. So you will be surprised to discover that when the creamy white flowers open flat with the sun, they do indeed resemble waterlilies, a favorite nickname in the catalogs.

One thing that has endeared the kaufmannianas to me is that over the years a planting will develop bulbs of varying sizes. Consequently some of the flowers will be small, others large, and they compliment each other splendidly.

Everyone has kaufmanniana preferences. I love Gaiety which has stems so short the flowers almost rest on the leaves; on a cold day it warms my heart. Shakespeare is an apricot and orange blend, Scarlet Elegance a really bright red, and Fritz Kreisler lends a rose tone to the early garden. Magnificent lives up to its name with a rose-red exterior and bright red and yellow markings in the throat of the white interior. There are others in yellow and red combinations.

Some kaufmanniana tulips today are hybrids with *T. greigi* and have leaves more or less mottled with brownish-red streaks. This does not detract from their beauty. *T. greigi* hybrids are also listed in many catalogs. Usually they are a bit later than those in the kaufmanniana section.

Because the weather is fairly cool, bloom on all these early tulips may last for weeks. They close their petals at nightfall and on inclement days and so survive the inevitable storms that follow the thaws that push them into flower. Only prolonged heat cuts short



Paloma's mottled foliage is characteristic of hybrids with T. greigi bloodlines.



T. fosteriana Intermezzo displays the dazzling color of her throat.

their display. Bloom is almost always earlier in subsequent seasons than the first time after planting. Plan to leave them in place for years.

Now to skip to the other extreme of the tulip season. I have had *T. sprengeri* flowering the second week of June. Not easy to find, it is worth giving special attention to the site for this red and yellow wonder once you locate a bulb source. Our weather in late May can be blazing and rainless. Without help, *T. sprengeri* buds may blast, so plant it where there is intermittent or high shade in the afternoon. Drainage (as with all tulips) must be perfect, but if the soil is very sandy, add some peat moss to the planting hole.

Place *T. sprengeri* prominently near the front of the garden. The waxy flowers are seldom more than a foot tall, and you want to be able to point them out to unbelievers. Also this placement will enable you to keep a close check on bud development in May and give the planting several thorough drinks if there is no rain.

Another species likely to flower after the more common May-flowering tulips are gone is *T. persica*. I keep forgetting to order it although it is widely offered. By all accounts it is a pretty dwarf with star-shaped blooms, bright yellow inside and bronzy on the exter-



First tulip of the season: T. pulchella violacea is a bright showoff.



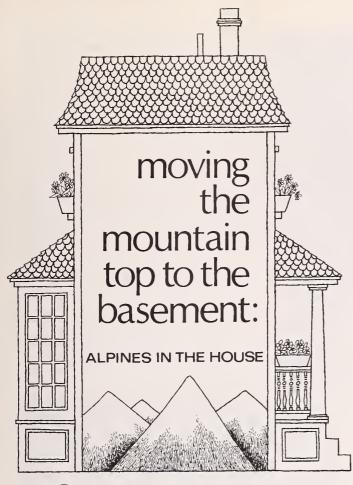
T. kolpakowskiana features wavy foliage and bright yellow stars.

ior. I shall give it the same general treatment as for *T. sprengeri*.

To round out our sequence I shall only remind you that April sees many other species in bloom as well as the amazing Darwin Hybrids and the early singles and doubles. Some of the most rewarding species are *T. fosteriana* named hybrids (there are many others besides Red Emperor these days), *T. clusiana*, *T. tarda*, *T. kolpakowskiana* and *T. praestans* Fusilier. Don't let the Latin names intimidate you.

May of course overflows with Darwin, Cottage, Lilyflowered, Bouquet, Late Double, Fringed and Parrot types. You can reap an extra time dividend by placing a few groups of these laterflowering tulips in a cool spot, good light but some afternoon shade, and away from buildings that might trap or reflect the heat.

Just remember that wherever you garden, your tulip season can be longer than May if you use imagination in choosing and planting these lovely flowers.





by Margery Edgren

Margery Edgren holds a Master of Science degree for biology from Northwestern University. Her rock garden pictured here won two major awards at the 1972 Philadelphia Flower & Garden Show: The Edith Scott Wilder Award for the outstanding exhibit in the horticultural classes and the Pennsylvania Horticultural Society Blue Ribbon for the "best of day" on Tuesday, March 14.

The connoisseurs and experts of alpine gardening know that I do not rank among their numbers. I have not roamed the rooftops of the world to witness the compact little gems in their native haunts, nor raised an alpine house to simulate their natural environment. And yet in the three years since I have made the acquaintance of alpines, these floriferous and charming plants have given me such pleasure that I wonder if more people could not achieve reasonable success in raising them without providing the seemingly endless list of stringent requirements so often encountered in the literature.

My effort in alpine and rock gardening began rather abruptly in the spring of 1969 at the Philadelphia Flower and Garden Show. There in one of the horticultural classes sat a large gray rock planted with attractive little plants that were unfamiliar to me at the time. In short, it was a lovely miniature rock plant garden. What fun! I determined to try one for next year's show.

A trip to the Pennsylvania Horticultural Library produced several books on alpines and rock plants and the names and addresses of various societies devoted to their culture. I'm firmly convinced that one should "join the club" when beginning any new endeavor. I did join several, including The American Rock Garden Society (and its local group, the Delaware Valley Chapter), The Alpine Garden Society, The Scottish Rock Garden Club, and The American Primrose Society. Members of these groups exchange seeds and plants, many of which are unavailable from other sources. In addition to a wealth of descriptive and cultural information about rock plants, the societies' journals carry advertisements for specialized nurseries where these plants are available.

Although I now acquire many specimens from seeds, cuttings, and local plant sales, it seemed wise initially to order a selection of plants from the specialty nurseries which had promptly answered my requests for catalogs. These were searched for names of plants described or pictured in continued



Judged to be the outstanding horticultural exhibit at the 1972 Philadelphia Flower & Garden Show, Margery Edgren's miniature rock garden was grown entirely under lights. The garden is two feet long, fourteen inches from front to back. The tip of the highest foliage in back is seven inches from table level; add one inch for bloom. The base of the rock garden wall is one and one-half inches from the table's surface, and the plants in front are three or four inches from the table level to the top.

Short day unit with time clock.

Where to write for information about rock gardening societies: AMERICAN ROCK GARDEN SOCIETY

Richard W. Redfield, Secretary Box 26

Closter, NJ 07624

ARGS: DELAWARE VALLEY REGION John S. Kistler 1421 Ship Road West Chester, PA 19380

AMERICAN PRIMROSE SOCIETY Alice Hills Baylor, Corresponding Secretary Stage Coach Road Route 2 Stowe, VT 05672

THE ALPINE GARDEN SOCIETY E. M. Upward, Secretary 58 Denison House Vauxhall Bridge Road London, England SW1

THE SCOTTISH ROCK GARDEN CLUB R. H. D. Orr, C.A. 30 Alva Street Edinburgh 2, Scotland

the books and journals as small in stature, beautiful in appearance, and therefore suitable for indoor culture or miniature gardens. I was swayed by such descriptions as "tiny jewels from the Pyrenees" and eschewed those described as "tricky in cultivation, rarely blooms." Individual plants were chosen for their lovely foliage or colorful flowers with preference given for ease of culture. Many proved perfect for miniature gardens and a few more suitable for specimen plants such as one might find in an alpine house.

While choosing plants from the literature. I became aware that I lacked a few of the "bare necessities" for raising some of my new selections. These necessities included an alpine house, leaf mold, sharp sand, John Innes mixture, limestone chips, a greenhouse of any kind, indeed, even a compost heap. It was a foregone conclusion that these specimens would have to succeed or fail under fluorescent lights.

Soil, then, was my most immediate problem. The innumerable formulas for potting mixtures seemed to have a few things in common. It seemed important to have a friable medium that would not pack like clay or get sticky or gummy. All the soils seemed to be full of grit, but needed at least some moisture retaining substance. Insofar as these things could be found, I attempted to get them. Peat was easily available and had to substitute for compost or leaf mold. Sharp sand was replaced by bar sand. Fortunately, my own stream bed contained that coarse gravel of varied size which refuses to be tightly packed and retains its rubbly nature, so well suited to the rambling roots of alpine plants.

Having prepared a reasonably gritty and friable soil, I recalled that many alpine gardening experts recommend heating the potting mixture to protect the plants from disease by killing any harmful organisms that might be present. It seemed an excellent idea, but as the aroma of cooking soil gradually permeated the farthest recesses of the house, I decided that my alpines would have to cope with whatever pathogens might happen to be in their planting medium.

Next came the problem of mixing several types of soil

such as acid and peaty types, or those with lime for plants whose nutrient requirements differed. Eventually, I decided to put the various nutrients into three different watering solutions and use much the same soil mixture for all the plants. The primary solution was a balanced chemical fertilizer prepared at the recommended strength for house plants. which was one teaspoon per gallon of water. The resulting pH with our water supply fell in a fairly neutral range around 6.5. This was used for watering most of the plants. A second solution for plants requiring acid or very peaty soils was prepared by starting with the basic solution and adding iron chelates at the rate recommended by the manufacturer to provide 5-10 parts per million in the final solution. For the plants requiring limestone, a small amount of agricultural lime was added to the basic solution. As this dissolved very slowly, some lime was always on the bottom of the container and no attempt was made to measure the amount accurately.

After potting, the newly arrived plants were placed under four foot fluorescent tubes installed in pairs of one warm white with one daylight to provide an adequate spectrum for plant growth. The pots were placed very close to the tubes to keep the plants compact and low. The tops of the plants were less than an inch from the light, but not touching it. The lights were left on 24 hours a day for the plants to attain good vegetative growth. Much to my delight, some of them started to bloom and kept right on doing so indefinitely under these circumstances. Others, such as the primulus, favored me with flowers after several weeks of short day treatment.

When two pairs of tubes were mounted together to illuminate a wider area for the miniature garden, it was necessary to raise the lights 4 or 5 inches away from the plants to keep the temperature below 80°F. The temperature of the basement being used was relatively stable, remaining around 68-74°F. all year. Plants could be kept cooler near the floor or, in winter, near doors or windows. Temperatures could be increased several degrees by enclosing the lights and shelves with cardboard panels that conserved the heat from the light units. The same cardboard panels or curtains of black plastic film were used to shield the short day plants from unwanted light. Although the humidity was relatively low in winter, most plants seemed to grow reasonably well with adequate watering. Plastic pots were used to reduce moisture loss. In summer, in contrast to the low winter humidity, my dehumidifier was set at 70% and ran almost constantly.

It became apparent very early that a daily check on the plants was a necessity. Not every plant needed attention every day, but a day of complete neglect usually resulted in at least one casualty or a setback. This chore soon became a pleasure anyway, since that seasonless "green room" of fluorescent lights always had something coming into bloom, germinating, or ready to be harvested. It brightened a bleak December day to see *Primula modesta's* charming umbel of bright pink flowers. Dull and frigid days in January and February were equally cheered by the incomparable azure petals of *Gentiana verna* spread above the bright green tiers of leaves or a tiny mound of *Androsace chamaejasme* crowned with a head of dainty white.

When the plants seemed well established they, were moved into their garden container, a feather rock carved with numerous holes for soil and plants. It astonished me to see



Shelf unit with 3 pairs fluorescent tubes, constant light.

how far their roots had spread in the generous pots I had provided. Confining the roots in 2-inch pots made transplanting into subsequent gardens much easier. Nutrient compatibilities were taken into account for plants that had to live together in a garden. Those requiring lime were set off in one section or preferably in a different garden by themselves. Happily, a few plants such as *Primula marginata* or *Mentha requienii* seemed tolerant of a variety of soil conditions.

Of course, appearance was of prime importance in garden design, including contrast and harmony in size, color, and texture. Bright green mats set off dark green spiky foliage and silvery mounds were pretty next to bright pink flowers. A few white blooms tended to brighten and blend the other colors to improve the overall appearance. That first year I had the satisfaction of creating a miniature rock garden that pleased me, and I have been collecting and combining additional delightful rock plants in each succeeding season.

Naturally, there have been failures along the way. Many plants have died, some from neglect but others for unknown reasons after growing well initially. There is no doubt that the expert with an alpine house and meticulous attention to

perfect growing conditions will raise more plants and often rarer plants than mine. It is gratifying, however, to find that a number of these remarkable little plants will adapt themselves to an ordinary basement and the gardening materials available at the local building supply and garden centers. Certainly the effort involved in rock and alpine gardening will not be popular with everyone, but it is tempting to conclude that this pursuit is within the reach of anyone who finds these compact floriferous little gems appealing.

A Few Favorites from my Miniature Gardens

FOR FOLIAGE

Rosettes small Saxifraga aizoon minor: outstanding

for green rosettes.

Androsace chamaejasme: outstanding

for green rosettes.

Androsace sarmentosa: outstanding for green rosettes; also lovely when

brought to flower.

tiny Draba dedeana: pretty when studded with snowy white flowers.

Saxifraga aizoon baldensis: delightful when planted in rocky depression

or crevice.

Mounds smooth Raoulia australis: whorls resemble silver

petals.

Raoulia lutescens

spiky Androsace carnea

Draba lutescens: produce attractive yellow flowers after cool, short days.

Draba aizoides: produce attractive yellow

low flowers after cool, short days.

Mats

Mentha requienii: marvelous paving plant, bright green mat; when under constant light is studded with minute purple flowers.

Silene acaulis: lovely green mat; under light favors me with sprinkling of

flowers.

Arenaria balearica (vine): beautiful mat, resembles a miniature vine as it drips

over a wall.

Upright Primula marginata: for me, the most important foliage plant; beautiful

golden meal on gently rounded and delicately notched leaves; perfect

foil for other plants.

FOR FLOWERS

Pink Primula frondosa and others of the farinose group: bright pink flowers.

Erodium chamaedryoides roseum
Dianthus 'Tiny Rubies': dainty pink

blossoms.

Armeria caespitosa 'Bevan's var.'

White Armeria caespitosa alba

Viola yakusimana: such tiny flowers; a miniature garden seems the perfect way to appreciate its delicate charms.





Calendar of Events

September

- 6-10 27TH ANNUAL CONGRESS

 AMERICAN HORTICULTURAL SOCIETY
 Olympic Hotel
 Seattle, Washington
 - 9 RED ROSE RENT DAY Star Roses The Conard-Pyle Company West Grove, PA 19390
- 16-17 GREATER PHILADELPHIA DAHLIA SOCIETY
 ANNUAL SHOW
 Greenhill Apartments
 City Line Avenue, Lower Merion
- 22-23 FALL FLOWER SHOW

 Norristown Garden Club

 Grand Court, Plymouth Meeting Mall, PA
- 30- HARVEST SHOW
 Oct. 1 PHS with the cooperation of
 Philadelphia Area Judges Council
 at Memorial Hall. West Fairmount Park

October

11-12 BIENNIAL STANDARD FLOWER SHOW Old York Road Garden Club Auditorium, John Wanamaker's Jenkintown

October

- 14 PENN'S WOODS DEDICATION
 11 am
 Bowman's Hill Preserve
 Washington Crossing State Park
- 24-26 FLOWER SHOW SYMPOSIUM
 Garden Club Federation of Pennsylvania
 George Washington Motor Lodge
 King of Prussia, PA
- 28-29 CHRYSANTHEMUM SHOW
 Delaware Valley Chrysanthemum Society, Inc.
 Delaware County Area Vocational School
 Broomall, PA

November

10 ANNUAL CHRISTMAS PARTY
District 1 Garden Federation of Pennsylvania
at Strawbridge & Clothier Auditorium
Plymouth Meeting Mall, PA

CLASSIFIED ADVERTISING

Wanted: Gardener with experience in lawns, flower beds, vegetables. One day a week from April 1 to November 1. Wyndmoor. Good pay. Write Box G, PHS, 325 Walnut St., Phila., PA 19106.

Large variety of unusual and rare plants for house or greenhouse for sale. Call TU 4-0497

Wanted: Cutting of *Passiflora caerulea* from plant originally purchased at Valley Gardens. E. D. Ballard. WA 2-4801.

Perennials—the usual and unusual—The Rustic Gardens, Route 413, Gardenville, Bucks County, PA (just 4 mi. north of Buckingham) invites you Thursdays, Fridays, Saturdays for a fine selection of perennials, wildflowers and herbs.

ROSADE BONSAI STUDIO. Bonsai, trained plants, containers, supplies, books, turntable. Saturday Workshops. Open Saturday or by appointment. Box 303, Ely Rd., R.D. 1, New Hope, PA 18938. Telephone (215) 862-5925.

Advertising copy should be submitted 8 weeks before issue date: November, January, March, May, July, September. Minimum rate \$5.50 (covers up to 35 words). Additional words 20¢ each. Less 10% discount for two or more consecutive issues, using same copy. All copy should be accompanied by check made out to PENNSYLVANIA HORTICULTURAL SOCIETY and sent to Patricia M. Cain, THE GREEN SCENE, 325 Walnut Street, Philadelphia, PA 19106.

A friend of mine once had a tiny garden in Germantown. It was the kind people took shortcuts through without realizing they were passing a garden. The garden had no apparent plan; it was filled with overturned glass jars used as propagating structures, branches pegged to the ground to form layers and natural seedlings marked with large stakes and labels. My friend's mission, as he saw it, was to perpetuate favorite species or varieties. The trunk of his car was nearly always filled with berry baskets or plastic bags of cuttings, seedlings, or layers of his own plants that he aggressively sought to share with others.

My friend was simply carrying on a tradition of preserving valued plants. Because of people like him, a Philadelphia physician and a London physician, separated by thousands of miles, can bask under sycamores propagated from cuttings of a tree known to Hippocrates. Because of people like him a garden form of silver bell was recently found preserved in a botanic garden in China. The silver bell had been sent there by a Philadelphia nursery family more than 50 years ago and had been feared lost.

Preservation through cuttings is possible because of the unique capability of plants to reproduce asexually. Plants reproduce sexually by seeds; they reproduce asexually by vegetative propagation. Were this miraculous means of reproduction to exist in humans it would mean that a person could be grown through careful development of a single limb.

The significance of asexual vegetative propagation is that it is a highly efficient way to reproduce plants rapidly. The majority of woody ornamentals propagated by nurseries are done by using cuttings. The procedure is relatively simple; the cuttings require very little care and the plants usually reach maturity in a shorter time than with seedlings.

Vegetative propagation permits favorite hybrids to be perpetuated in exactly the form most valued by individuals. Many years ago I gave a half-dozen grafting scions* of a weeping pine to a Maryland nurseryman. The parent plant subsequently died, but two years ago small plants from the original came back to our garden. From the original half-dozen plants, many dozens have been propagated.

Popular articles on plant propagation usually fail to mention one very important reason for plant propagation. It is the personal satisfaction derived from propagating your own plants and sharing the progeny with others. This creative pleasure is often overlooked in today's context of 'instant' gratification: instant gardens or instant landscapes. Plant societies encourage members to exchange plants with one another. If we are to perpetuate the many desirable garden forms that are becoming more and more difficult to find in commercial nurseries, sharing and exchanging plants have almost become a necessity. Few nurseries'can afford to grow the almost infinite variety of plants available. Even specific varieties of such popular plants as rhododendron can now be found only in private collections. Fortunately the American Rhododendron Society is very active and rare hybrids can usually be located through ARS members. Other societies do a fine job of perpetuating named hybrids of their interests: rose, lily, holly, iris to name a few. But you need patience to locate what you want and unless you know a gardener who has a particular form of silver bell, fringe tree or one of the lovely forms of the mock orange, you may find it is virtually impossible to locate them.

Vegetative propagation of woody ornamentals is made possible by a group of specialized cells just under the bark of the stems. Left alone these cells would go about their job, which is to transport nutrients for the maintenance of the plant. If the tip of the stem is cut from the parent plant and given a favorable environment, these specialized cells have the incredible ability to change their function and become instead growth tissue and produce roots.

Budding or grafting differs from making cuttings. They involve removing a scion from one plant and placing it over a stem wound made on an already established plant of the same general parentage; the wound heals over and accepts the scion. This method is used extensively in propagating apples and roses, two genera which require particularly hardy roots. Grafting, slower and more exacting than propagating by cuttings, has been practiced for thousands of years; only in the last century has the rooting of cuttings been practiced to any extent, and only in the last decades has the development of scientific aids to rooting been carried to the point where we are now able to root many plants before thought impossible. For example, the majority of rhododendrons today are propagated by cuttings rather than by grafting because root hormones and intermittent mist were developed only within the last 25 years.

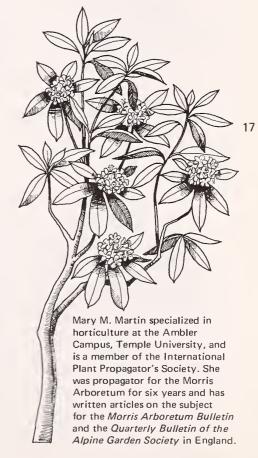
The new aids facilitating propagation include vermiculite, perlite, styrofoam and polyethylene. In addition, watering devices have been refined and are now used extensively in the mass production of landscaping plants. Automatic water misting devices are used in open field production of azaleas.

*A scion is the detached portion of a woody plant containing two or more buds to be used in grafting the green scene • sept. 1972

the why and how of propagating woody plants



by Mary M. Martin





Cut branch on the diagonal.



Remove leaves from two-thirds of the cutting.



Dip cutting in rooting hormone. Place cutting 1%" in rooting medium.

drawings by Ed Lindemann, PHS Horticulturist

getting started

For the beginner, assembling elaborate materials and sorting through the volumes of literature and advice offered by other gardeners can be time consuming to the point of discouragement. Sophisticated aids to rooting are unnecessary to the amateur who wants to propagate a few cuttings. Such aids merely increase the percentages of rooting. If the beginning propagator uses easily rooted plants such as holly or azaleas in his first attempt, education as to the "how" will be much less frustrating. Successful early attempts will encourage the new propagator to take on more difficult species and to invest in more equipment.

The actual equipment needed for propagating woody plants is a sharp knife, a box or flat three to five inches deep, and long and wide enough to accommodate the number of cuttings you plan to take. The box should be filled with rooting medium. You will need also a rooting hormone such as "Rootone" or "Hormodin," and polyethylene sheets or bags.

The propagating medium must support the cuttings, be fibrous enough to hold water but porous enough to permit the slow passage of water. For example, a 50-50 combination of sphagnum peat and coarse sand is an excellent medium. If these water and support requirements can be met with any other inert or nearly inert material such as perlite or vermiculite, it will be an adequate substitute.

Whether or not the cuttings will root is largely determined by the environment we provide them with once they are removed from the parent plant. An ideal environment is the propagating structure, and the classic structure is the overturned bell jar or mason jar. The structure's job is to provide a protected environment where heat, light and moisture are easily controlled. Plant grafters create a favorable environment by wrapping the scion and wound with raffia or rubber strips; air layers are protected by wrapping a wound made on a branch or stem in a moisture holding material such as sphagnum and enclosing it with polyethylene.

The interrelationship of heat, light and moisture is so close it is virtually impossible to determine priorities. We can start with the premise that to survive, ornamental plants require a range of optimum temperature, light, water, nutrients and mechanical support. These requirements can easily be observed in a simple houseplant. Sever a small piece of stem from the parent plant and it has the same requirements as the parent, only more urgently so. A wide temperature range exists under which woody ornamentals in the Delaware Valley will grow; in the cutting box, the optimum is from 68° to 75°.

Closely allied with temperature is light. All green plants need light to photosynthesize; that is, to transform radiant energy from the sun into chemical form for their survival and growth. The amount of light necessary for cuttings is about the intensity required to maintain a philodendron in good health and color. Intense sunlight through glass or polyethylene can cause temperatures to soar. The high temperature itself is not as critical as the water lost through evaporation. The correct amount of water is the most difficult environmental requisite the beginner must learn. A box covered with polyethylene creates a virtually watertight enclosure and water loss is minimized. Overwatering drowns the cuttings or rots the soft tissues before they produce roots.

There is little need to detail at length the slight variations in procedure and certainly no need to fill pages with lists of just what plants will root best at what phase of the moon. Specific optimum rooting times can be determined by consulting one of several books on propagation.* With slight variation the requirements are the same whether rooting cuttings in summer, fall or early winter. Generally, deciduous shrubs such as Weigelea or mock orange are propagated in July and August when the wood of the current year's growth has hardened a bit. Semi-evergreen and evergreen shrubs such as azaleas, hollies, yews, and pyracantha are propagated from late August through December.

To take cuttings we begin by selecting terminal stems about three inches long from healthy plants. Remove the leaves from the lower two-thirds of the cutting. With a sharp knife make a slanting cut at the base of the cutting. Dip the base into a rooting hormone. Flick off the excess hormone powder. Insert the cutting into a rooting medium to a depth of one to one and one-half inches, leaves just touching each other. Firm the medium around the base of the cutting. Water well. Completely enclose the box of cuttings in a freezer bag or polyethylene sheet. In summer, place the box away from direct sunlight; in winter avoid extremes of heat and cold, temperature should be at least 65°. Check every few days for watering. If too wet, open the enclosure for a few hours, then reclose. If it's too dry, water. Remove any dead leaves or cuttings.

After six weeks the cuttings should be rooted and ready for potting. Summer cuttings may be sunk into the ground in a well-protected place and left over the winter. Cuttings taken later in the year may be kept in a cool place $(60^{\circ} \text{ to } 65^{\circ})$ and planted outside in the spring.

*If you are interested in reading more about propagation, THE GREEN SCENE recommends PLANT PROPAGATION IN PICTURES, M. Free, Doubleday, 1957, and HAND-BOOK ON PROPAGATION, Brooklyn Botanic Garden, 1957.

they got it together continued

World of Bulbs. A sample of her writing and photography appears on page 10 of this issue of THE GREEN SCENE. Of her gardening experience Ms. Miles says: "I think Philadelphia is a gardener's paradise. I grew up in Briarcliff Manor, NY, northern suburb of New York City in the Hudson Valley, a lovely place really, but I never had seen an azalea much more than two feet high until I came here. Our place in Doylestown was nearly treeless when we first arrived and I've spent the last six years trying to grow trees and bushes on it; some of the living sticks are now taller than I, thank God."

Barbara H. Emerson, a horticulturist, is responsible for herbicide and other growth regulator technical information for Amchem Products, Inc. Besides writing and editing, she oversees storage and retrieval of experimental data and the research department's library. "My desk is where the inquiry buck stops," she says. She is especially interested in heathers and in growing native North American plants. She and her husband are creating what they call "a vest pocket woods . . . really vest pocket!"Mrs. Emerson was president of the Garden Writers Association of America, and is chairman of the PHS Iibrary committee, and is on the Council.

John S. Kistler, a landscape architect, is also chairman of the American Rock Garden Society-Delaware Valley Chapter. He is active in the Pennsylvania Bonsai Society as well. A life member of PHS, John Kistler says that "except during two wars, I've been to every Philadelphia Flower Show since the early 1930's." Kistler enjoys flower and vegetable gardening. He is a member of the PHS Council.

Jean Byrne, Editor. Formerly an associate editor of Emphasis, an external corporate magazine circulated nationally by Smith Kline & French, a Philadelphia pharmaceutical firm, Ms. Byrne has also done medical writing as well as free-lance articles for newspapers and magazines. She graduated from the University of Pennsylvania where she majored in creative writing. She is currently attending classes at the Arboretum of the Barnes Foundation. In addition to THE GREEN SCENE, she edits PHS News, Yearbook, and the Philadelphia Flower & Garden Show Guide.

Léonie Bell, a graduate of the Pennsylvania School of Horticulture for Women (Ambler), is a self-taught botanical illustrator. When she was 20 years old she illustrated John M. Fogg's Weeds of Lawn and Garden in just four months. This achievement was followed by pen and ink drawings for H. V. P. Wilson's African Violets. Subsequently, Ms. Bell again collaborated with H. V. P. Wilson to produce The Fragrant Year. Of this book, Graham S. Thomas, the eminent English rosarian, wrote in the Journal of the Royal Horticultural Society: "The pencil drawings by Léonie Bell are, I think, the best I've seen for many a year, if indeed they have ever been surpassed for exquisite botanical accuracy combined with consummate artistry.... The book is by both authors [Bell and Wilson] . . . written in an ecstatic way, rather turgid with telling phrases and pithy adjectives, charming similes and apt quotations, while the big chapter on roses reads more like a story." We are fortunate to have an article by Ms. Bell scheduled for the January issue of THE GREEN SCENE.

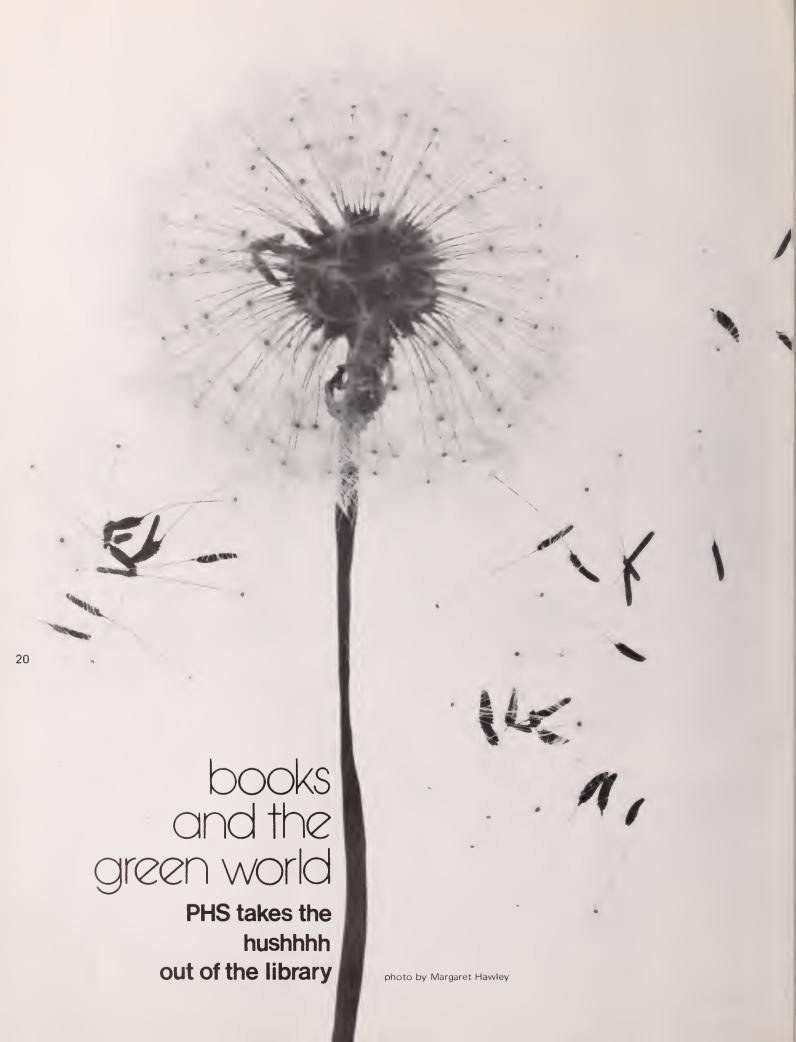
Ralph M. Sargent, Emeritus Professor of English, Haverford College, has a scholarly as well as a practical interest in horticulture. Sargent wrote the introduction for the Imprint Society edition of Peter Kalm's *Travels into North America* (18th century) to be published this month. He has also traced and photographed William Bartram's route through the Carolinas. Sargent is president of the Philadelphia Botanical Club and holds office in several prestigious botanical organizations.

M. M. Brubaker of Mallard Gardens in Chadds Ford, Pa., says: "The only horticultural facts about myself worth publishing are that I struggle with fifty acres and four greenhouses." An organic chemist, Brubaker spent his youth in North and South Dakota, Manitoba and Minnesota. He worked for Dupont Company from 1926 until he recently retired as assistant director of the central research department. Camera-shy as well as reticent, Brubaker when recently queried about a photograph of himself offered instead some "nice pictures of my granddaughters and my dog." The photo shown, converted from a color transparency by Brubaker, shows a happy, reticent, camera-shy man from the wide open spaces doing what he most enjoys doing.

John D. Corbit, Jr., is an obstetrician and gynecologist whose primary fascination with the plant world is genetic aberrations in conifers. He says his horticultural history started "at birth on a Pennsylvania dairy farm where my grandmother maintained a greenhouse as a hobby." Later his studies in biology led him "to the Wisters and Woods, and to Jack Fogg and Laura Barnes, which opened both the facilities of the Morris and Barnes Arboreta to me." His earliest hobbies centered on cypripedium (orchids) and hybridization of hollies. Of his present garden, Corbit says, "Since our garden consists of less than two acres of land, it was soon necessary to become interested in smaller plants because of the crowding from the evergreen background. Our present interest is in the collection and identification of dwarf plants, chiefly conifers." Corbit is a member of the PHS Council.

Herbert W. Goodall, Jr., is director of corporate communications for Aitkin-Kynett Co., Inc. Goodall's first contact with PHS was organizing public relations when the Society moved from Suburban Station to its present location. An amateur horticulturist in the best sense-"I love plants, but don't know a lot about them"-Goodall says he's good in the muscle department. "I enjoy weeding and have always been available for the moving and pushing in the garden. Right now I'm raising begonias and fuschias inside, and roses and lots of border plants outside." Goodall is a past vice-president of the Society, is on the Council and is chairman of the 1973 Flower and Garden Show.

When Phyllis Williams started gardening, she really plunged in. Classes at the Ambler Campus of Temple University, Longwood and PHS included courses in floriculture, propagation and fruit growing, among other subjects. She says, "Ms. Garra's classes at PHS started me on herbaceous plant materials. And Ms. Garra, as well as Lois Paul of Longwood Gardens, managed to hammer into me taste and a feeling for scale. Right now there's a little of everything in my garden and my greenhouse." A persistence that grew out of her training as a biochemist at Radcliffe leads Ms. Williams to say, "I keep things that do not do well until I find out why." Ms. Williams is a member of the PHS Council.





Julie Morris is the horticultural librarian at the Pennsylvania Horticultural Society. In addition to earning a degree in sociology from Temple University, Ms. Morris graduated from Ambler Campus (Temple) with a degree in ornamental horticulture.

Behind the poetry of the landscape are the mechanisms of dramatic events the whirr of a studded pollen grain through the air; the report of a bursting seed; the tinkle of sap in the tubes of a tree trunk; the whisper of air and water being converted by chlorophyll; the twang of red rays ricochetting from the petal of a cardinal flower; the muffled sounds in roots expanding with the power of dynamite.

THIS GREEN WORLD

by Rutherford Platt Dodd Mead & Company, New York 1943

Meeting the world of green growing things through Rutherford Platt's imagination and understanding excites and challenges the reader. For those who accept the challenge and understand the message of the plant world, life will never be the same. Growth, activity and change, all facets of our common environment, create questions and problems for those of us concerned with the green world. We find that we need a place to look for answers and to learn more.

The PHS Library is the center for horticultural activity not only within the Society but very often for the entire gardening community of the Delaware Valley. The usual library hush does not exist here and we have no typical day. For the horticultural staff the library is our base of communication, meeting ground and working area. Reference files, periodicals, catalogues and 12,000 books are close at hand and in constant use.

a day in the life of a horticultural librarian

MONDAY

- 9:45 A member wants to verify plant names for a plant society seed list. Gradually INDEX KEWENSIS and all its supplements bury my desk as we go from a to z and back again.
- 10:25 I leave the books to help a graduate student researching a rare herbal. She arrives with photographic equipment and her assistants to shoot extensive sections of the rare book collection.
- 10:40 A frantic caller wants a quick cure for a badly sunburned cactus: the poor plant was subjected to a sunlamp treatment.
- 10:50 Mrs. M. is going to Great Britain and wants to know which gardens to visit.
- Noon A young member arrives to read all about grafting.

- 2:00 A short seminar is held for Parkway Program students before they leave to visit a vest pocket park.
- 2:45 A clinic held downstairs ends and participants pour into the library full of interest about what they've just learned.
- 4:00 A member arrives in the Library carrying leaves with severe cases of geranium crinkle and sooty mold. Staff horticulturists tell owner there is little hope for the plants affected.
- 6:00 THE EXPRESSWAY EXIT: A book passes from my car to a harried student who's on the way to an evening class. Emergency mission accomplished.

So much of today's activity is instant and predigested. Gardening shouldn't be, and the wise gardener recognizes that commitments must be made. There comes a time when the "how-to" books (those quick guides which serve as useful tools for the beginner) no longer satisfy the reader who wants to know "why" not just "how."

Here's where we come in. One of our conceits is our staff knowledge and understanding of information available. Our members need show only the slightest interest in a subject and we can supply any number of books to satisfy their hunger for information. We are challenged to look beyond the obvious answers and provide a background so the reader can get a complete picture. An intellectually insatiable 15year-old confounds our horticulturists with inquiries about the metaphysics of grafting. Once gratified he goes on to study the physiology of the many plants in his collection. Mrs. M. who was planning to visit Great Britain was treated to some garden history in addition to the guides she wanted. The clinic members who arrived after learning about planning property landscape were encouraged to read not just the prettiest books, the latest or they were given the classics which are unequaled in their clarity of thought, judgment and just plain good writing.

It seems to me that the duty we owe to our gardens... is so to use the plants that they shall form beautiful pictures; and that, while delighting our eyes, they should be always training those eyes to a more exalted criticism....

COLOR SCHEMES FOR THE FLOWER GARDEN by Gertrude Jekyll Country Life, London 1921

I have strong feelings about our gardening heritage, especially in the Philadelphia area. Philadelphia is the birth-place of American horticulture. Today many nationally recognized plantsmen live in the area. Much of what we have inherited from the early horticulturists remains in their books and journals. If we lose interest in their literature it will disappear and so will an important phase of our history. While we value and respect the past, we are very much with

the present. The latest books arrive daily and a quick glance at the periodical section, an often neglected part of the Library, will show the more than 215 journals regularly received by PHS: plant society publications, trade journals, institutional horticultural and popular gardening magazines. Should members want to know about horticulture in Africa or Australia, the information is here. Each type of journal offers a new look or approach. The latest on the environment, organic gardening, flower arranging, rhododendrons or rock gardening arrives regularly. Different ways of saying the same things often promote a better understanding of a subject.

Evening study sessions with staff and members are full of lively discussion. Each session covers a different aspect of horticulture and the Library. A recent evening on rock gardening was sparked with controversy over references for nomenclature and the vagaries of the tiny plants bearing the ponderous names.

Inquisitive growers seldom limit their interest to a few plant families. They may simultaneously experiment with plants from environments as diverse as deserts and rain forests. Such interests are natural openings for the introduction of plant geography and exploration. Knowing where a plant comes from leads to a clearer understanding of its needs and habits. The romance and excitement found in the books written by plant explorers can be more spellbinding than the most thrilling fiction.

After an early breakfast, I raced up the ridge. The bamboos flung water at me, the little porcelain gentians with wonderstruck blue eyes stared after me, but I stayed not. On and on, till the forest came to an end, and the mountain ridge grew steep and difficult, and the wind caressed like the blade of a razor. Now I was leaping from rock to rock on the shattered cliff, till brought up short by the hassocks of dwarf Rhododendron which covered the northern slope; only then did I fling myself down to explore and collect.

THE ROMANCE OF PLANT HUNTING

by Capt. F. Kingdon-Ward Edward Arnold Company, London 1924

Many of our visiting horticulturists are authors of books in the Library. From them we invariably learn something new about our collection. A recent visitor from Africa is enthusiastic about our books on the plants of his country. They have become collector's items in his homeland. The graduate student who was researching the obscure herbal finds prototypes in our rare books which untie some of the mystery behind the history of these early herbals.

The people who use the Library keep it a lively place. The staff has plenty of zip and uses almost every part of the collection every day. As anyone who has visited us knows, we can rival the most adept mountain goat on the spiral stairs which lead to the gallery housing all of the bound periodicals as well as the botany and flora sections.



Plants sitting on floor in paper bags by Julie Morris's desk await diagnosis.

another day in the life of a horticultural librarian WEDNESDAY

10:10 PHS members who live in a West Philadelphia commune ask for books on herbs and organic gardening to guide them in planning their new farm.

Morning An author in England writes for infor-Mail mation about our holdings of an 18th century horticulturist.

2:00 Our students from the Parkway Program arrive with ideas for a new project and need books to carry it out.

Afternoon A correspondent from India writes to get information about nurseries in the U.S. as well as other American sources of plant materials.

2:40 An exhibit of bonsai books is set up in the library for a lecture.

2:50 Flower Show volunteers need reference books from which to check plant lists.

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- 3:00 An evening study session is planned; the subject is roses.
- 4:10 A passionate rock gardener now in his primrose period wants all of the material available on these gems. We have seen him through his penstemon and fritillaria phases.
- 4:30 A call to California and a letter to England will bring second-hand editions of books needed as replacements and extra copies.

- 4:50 The spine finally falls off a much used book and is shipped upstairs to the newly established workshop.
- 6:30 A meeting of the Library Committee helps the staff set out in yet another direction.

The good gardener knows that one test of a healthy plant is the way it feels to the touch. This is why we can't be afraid to touch our plants, the sensual involvement is necessary. I think the same kind of involvement is apparent in this special Library. It's a place of "please touch," "please use."

Gilchrist

Edmund

ρ



Evening study sessions

are full of lively discussion.



The usual library hush does not exist here and we have no typical day.

The landscape is a vast system constantly in action . . . this natural world is thrilling in the way it works. I am not thinking so much of the poetry and melody, or of reflecting on a tree or flower as you might on a masterpiece in an art gallery. I am thinking of the mental stimulation, of the value of information, of accuracy of expression, of the feeling of freedom, and sheer entertainment—all around us and available at little expense and bother for anyone who will only take a look. . . .

THIS GREEN WORLD

by Rutherford Platt Dodd Mead & Company, New York 1943

Priscilla Greentree þ

John C. Swartley of Ambler,

Pa., was chairman of the horticultural department, Temple University, from 1957 to 1967. His master list of the largest trees in the Southeastern Pennsylvania area appeared in the June 1970 issue of the Morris Arboretum Bulletin.



Leola L. Willaman of Plymouth Meeting, Pa., is a highly competent gardener whose hobby encompasses both greenhouse and outdoor gardening.

Growing Interests

Growing Interests will be a regular feature of THE GREEN SCENE. Readers are invited to submit information about their favorite plants. Let us hear what you like, why you like it and how you grow it. We're interested in your problems with the plant as well as your successes. Manuscript should not exceed 250 words (one typed page, double space, 55 characters).

Pyrus calleryana

The Callery Pear is a handsome, vigorous, free-flowering tree with white flowers about one inch across and with small russet colored fruits, about one-half inch long, slender stalked and dotted. The foliage is dense and in the autumn turns red to glossy scarlet. The habit is more or less pyramidal.

The Callery Pear is a latecomer as an ornamental. It was introduced from China in 1908 and because of its resistance to fireblight and pear decline (a virus disease that can quickly or gradually kill the entire tree) it attained some fame as a budding root stock for commercial pear varieties. It is not hardy for the colder climates either as rootstock or specimen (listed in Rehder's Zone V-Ohio, Indiana, Kentucky areas).

There is only one important cultivar— 'Bradford.' It was selected from seed collected by Frank Meyer in China in 1918, and grown at the U.S.D.A. Plant Introduction Station in Glenn Dale, Maryland. It was named in honor of F. C. Bradford, a former director of the station. 'Bradford' is a more formal, upright tree with thicker and more glossy leaves, and since it is grown by budding, it is ideal for city streets. An added bonus is that it tolerates air pollution as does the species.

The largest known Callery Pear in the five county area is at the Morris Arboretum, a two-trunk tree 2'6" in diameter at the ground level. Unfortunately it is in poor condition. There are several fine, large trees in the annex of Bartram's Garden. The largest of these is nearly as large as the one at the Morris Arboretum.

John C. Swartley

Anemone japonica

A choice addition to the September garden is the Japanese anemone (Anemone japonica), airy and graceful, which naturalizes itself in the border or woodland. The flowers are cup-shaped, on three-foot wiry stems and have golden stamens. The petals, which are really showy petal-like sepals, can be rose, white, pink or lavender. They bloom from September to frost. Several named varieties are available.

These anemones are individualists, difficult to transplant and to propagate. But they seed themselves if the location suits them. They prefer a rich soil with adequate humus, somewhat alkaline. They like semishade. Division of established clumps is recommended for spring, but we have never been successful. Commercially it is propagated by root cuttings. Here is a way we have found useful and we like it. Carefully dig out a small seedling, being sure to get all of the long bare taproot. Wrap it in soil and sphagnum, then enclose this "sausage" in chicken wire. Plunge it in the open garden to the rim, pack soil around it well and cover with salt hay for the winter. When a tuft of green leaves appears in the spring the plant can be transplanted, still in its wire covering. The wire will soon rust away. Or the plant can stay in the nursery row until fall, when it will be in blossom, ready for transplanting to its permanent place or for sending to a plant sale.

Japanese anemones are worth most any effort, and once established are a delightful addition to any garden and are excellent in dried flower arrangements.

Leola L. Willaman

Gentiana septemfida

A wonderful and most beautiful late-summer blooming plant is the exquisite *Gentiana septemfida*. There are many different gentians that are beautiful; however, *Gentiana septemfida* is my favorite. The one I have in mind grows under a very large oak tree, which allows it to have a great amount of shade during the hot part of the summer day. The gentians require both a shady and moist area. At least half shade is sufficient; however, the moist area should be in a place where there's lots of water, for example, near a stream or the bottom part of a hill where rain water will run.

The brilliant bell-shaped blue flowers make your eyes glitter at their magnificent beauty. Not only are the flowers fantastic but the foliage looks great too. *Gentiana septemfida* grows close together with the stem six to ten inches in length holding small leaves and exquisite flowers.

Gentiana septemfida keeps your garden alive in the late summer months of September and October when all of the spring plants have been finished and the summer blooms are dying. This is the plant!

Joseph Miller

Begonia evansiana

Some thirty years ago, when I first became interested in begonias, I was tantalized by references to a hardy species, *Begonia evansiana*. I questioned that a genus native to semi-tropical climates could develop one species cold-resistant enough to survive our winters. After much study and inquiry, I learned that *Begonia evansiana* was growing happily under an apple tree in Mrs. Arthur Hoyt Scott's garden in Rose Valley. I also learned that only the underground part, a tuber, survives the winters.

Do not be misled by the word "tuber" and picture to yourself something like the showy tuberous hybrids, either the summer blooming types or the so-called Christmas Begonias. The *Begonia evansiana* is a dainty beauty. A slender stem rises to a height of 12 to 18 inches and bears alternately wide, ovate-pointed leaves, light green with red veins. Pink flowers come from mid-August through September, sometimes into early October, depending upon situation and season. There is also a white flowered variety, which I find less hardy.

Begonia evansiana does not make seeds for me. It does not need seed for increase, as the little tubers, borne at the axils, drop as the plant fades, lie on the ground all winter and sprout about mid-May, when the mature plants reappear. Do not let this habit of late arrival deceive you into thinking that the planting is dead. All plants, both large and small, start dropping, joint by joint, before frost comes. This change suggests that their life is governed by the length of day, a supposition confirmed by similar habit under greenhouse culture.

I must confess that I have not been wholly successful with *B. evansiana*, whether because of heavy soil or too dense shade, I do not know. It will take full sun, but likes flickering shade. Unfortunately, a tree that gives flickering shade at one state of its growth, grows to the point of casting heavy shade. Also, I have had trouble with leaf spots, perhaps caused by disease, perhaps by dropping water from overhanging branches. Other growers in this vicinity have found the right situation and have no trouble.

By way of anticlimax, I must warn you that few dealers list *B. evansiana*, probably because of its habit of winter dormancy. Your most likely source is an amateur gardener who has a well established colony* and who will give you small tubers, or even mature ones.

May T. Drew



Joseph Miller, Jr., of Phoenixville, Pa., was named Junior Horticulturist of the Year by PHS for his expertise in Alpine gardening and propagation. He will attend Delaware Valley College of Science and Agriculture in Doylestown this fall.



May T. Drew of Penn Valley, Pa., is a former vice-president of the American Begonia Society and past president of the William Penn Branch of the ABS. A graduate of Wellesley College, Ms. Drew was among the first students to attend classes at the Arboretum of the Barnes Foundation.

^{*}Editor's note: For difficult to find cuttings, consider advertising in our classified section.



ROADS AND BRIDLE PATHS

wissahickon valley

FAIRMOUNT PARK, PENNSYLVANIA

Issued by The Friends of the Wissahickon, Inc.

green scene

HORTICULTURE IN THE DELAWARE VALLEY

Jenkintown, Pa. 19046 671 Meeting House Rd. Mrs. Herman A. Hey, Jr.



natural materials for Christmas decorations





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green scene

HORTICULTURE IN THE DELAWARE VALLEY

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Joanna Reed works on Christmas

decorations in her workshop.

Front

Cover:



horticultural harvest

For the horticulturist, harvest is a six-month season. In June and July the early flowering perennials—columbines, primulas, candytuft, species narcissus and tulips—set their seeds. From then until Thanksgiving seed heads form in continuous succession: shortia, trillium and maples in early summer; vaccinium, veronicas, rhododendrons and many more spring blooming native wildflowers in August; and, finally, gentians, asters, goldenrod, liatris and butterfly weed in the fall. Not a week goes by without some choice plants offering their future to the gardener who cares enough to take the offer.

Why would anyone collect seeds when everyone can buy them? The first answer is that more and more often you can't find the seeds you want in even the most complete catalogue. The seed business is not immune to the laws of economics, and the facts of business life are leading seedsmen to concentrate on the new, the showy and, above all, the popular. The species or variety you set store by may be just the one to fall by the wayside. So gather its seeds in self-defense.

But there is another and perhaps a better reason to harvest seeds. That is to share them with your friends. The annals of horticulture are replete with stories of friendship based on the exchange of plants. Think of John Bartram and Peter Collinson. Seed exchanges are part of the programs of most plant societies. They promote companionship, they improve collections and, most important of all, they prevent the loss of rare plants. The occasional collector who will not share his treasures all too often lives to see them vanish from the face of the earth when some blight strikes his garden. Collectors who share their riches with others have the satisfaction of knowing that they are preserved for everyone.

Don't be deterred by the notion that harvesting and growing seeds are only for the experts. The fact is that with normal observation, common sense and a little technical instruction everyone can do it. And most people find that growing plants from seed is one of the pleasantest of experiences. Cuttings are fun but nothing matches the thrill of watching a seedling emerge from a pan of sphagnum moss.

Once you have become conscious of seeds, you will find them all around you. Many years ago, a trip I took to a horticultural garden in Southern California yielded the seeds of an extremely drought-resistant acacia I have not seen listed anywhere. A recent visit to the Missouri prairie netted seeds from ten native species. It is exciting to think how many seeds could be harvested along the roadsides of the pine barrens, or even the highlands of the Wissahickon described in an article in the last issue of *The Green Scene*.

Part of our job at the Pennsylvania Horticultural Society is to help our members understand the collection and sowing of seeds. We give clinics; we answer questions; we provide literature; and we encourage seed exchanges. Seeds will be an important field of interest for this publication. We start by suggesting that our readers reap a harvest of seeds this fall and give them, or seedlings grown from them, to friends at Christmas. May your Thanks-giving be a truly horticultural one.

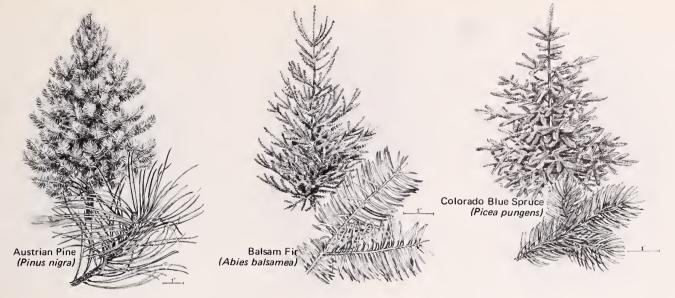


a promise of christmas trees to



by Rita M. Rammrath

Rita Rammrath is an information specialist with the USDA Forest Service's Northeastern Forest Experiment Station, Upper Darby, Pa. She holds a BA from Rosemont College and an MA in Communications from the Annenberg School of the University of Pennsylvania.



photos and drawings supplied by the U.S. Forest Service

When my parents were children, they went out to the woods on Christmas Eve to choose and cut a fresh Yule tree. When I was young, we went down to the corner gas station or drug store to buy our tree from the Lions or Jaycees. Now that the ersatz tree is in vogue, I cringe to think what kind of holiday tree my children will buy and where they'll get it. But really, I do know better.

My informants tell me that my children's chances of getting a good natural Christmas tree will be even better than ours today. That's because scientists—including those of the USDA Forest Service—have made some progress in developing genetically improved trees. In addition, scientists are working out better ways to grow trees in plantations. Cultural measures include better site preparation, sound planting practices, weed control, shearing and shaping, and foliage color control. Caring for the trees properly once they get home is also being stressed.

The trees of the future will be "better" in color, form, needle retention capability and growth rates. And Christmas trees will, again, compete in safety and appearance with their plastic and aluminum replicas.

selecting superior races & individuals

Trees from one region may have characteristics superior to those of the same species from other regions. Or within a region, certain individual trees may be genetically superior to their companions. These superior races and individuals, discovered through provenance (adaptability) studies, can be

used to produce better seed or planting stock.

Provenance studies are made by comparing plantings of trees of the same species, but of many different geographic origins, to determine their adaptability to local conditions. Forest Service geneticist Dr. Peter Garrett of Durham, N.H., has undertaken provenance studies of eastern white pine (Pinus strobus) in several locations along the East Coast. Some of the test trees are growing in Pennsylvania, including plantings at Bowman's Hill in Washington's Crossing State Park and at Longwood Gardens in Kennett Square.

selective breeding & hybridization

Trees that are genetically superior and adapt well to a region are used for selective breeding to produce progeny with the most desirable characteristics of the parent stock. Selective breeding of trees takes many years, but in the long run will probably produce the most nearly perfect Christmas trees. One promising product of selective breeding is a cross between shore pine (Pinus contorta) and Sierra Nevada lodgepole pine (Pinus contorta murrayana)—races within a species.

Hybridization is a form of selective breeding in which crosses are made between two different species, rather than between races within a species. Many evergreen hybrids have been developed; the Forest Service has issued a bulletin describing 40 developed by the Institute of Forest Genetics at Placerville, California.

Although these hybrids were developed at Placerville in a research pro-

gram aimed primarily at producing better wood from faster growing trees, several have turned out to be of value as Christmas trees.

Of course, not all hybrids are produced artificially: some are discovered in nature. One such find was a cross between Austrian pine (Pinus nigra) and Japanese red pine (Pinus densiflora), that occurred in southern Michigan. This hybrid appears to have potential value as a Christmas tree for those who prefer a long-needled tree. Although it is fast growing and will need shearing, it has good color and form, and its needles are not as stiff as those of Austrian pine.

Neither of these genetically mixed stocks is the perfect tree. But with some work they might prove valuable.

introducing exotic species

The use of exotic species offers another possibility, although they are costly to procure and costlier still to nurture.

Exotics are not new to agriculture or forestry, nor to the Christmas tree industry. In fact, a large part of the industry is based on tree species that are not native to the area where they are now grown.

Take the Scotch pine (Pinus sylvestris). Although it is America's best-selling Christmas tree, there are no native Scotch pines in America. Races of Scotch pines occur in Scotland, of course, and some 21 different races can be found from Spain north to Scandanavia, and east to Siberia. Because the Scotch pine is more adaptable than any other commonly grown species of Christmas tree, and because it has done







so well in America, it has opened the possibility that other species might be as successful here.

According to Russell Walters, a silviculturist with the US Forest Service in Burlington, Vt., many exotic trees have possibilities as Christmas trees. Among them are about 25 species of fir native to the Mediterranean and to Asia. Their potential has never been thoroughly tested. They are all true firs of the genus *Abies*, and most have the needle characteristics and crown shapes desired for Christmas trees.

Pines, too, offer several similar possibilities. Two of the most promising are Macedonian white pine (*Pinus peuce*) and Himalayan pine (*Pinus griffithii*). These are five-needled white pines, and

they may have even more attractive foliage than our popular eastern white pine.

Oriental spruce (*Picea orientalis*) and Siberian spruce (*Picea ormorika*) are two of several spruce possibilities. Both have short, dark needles and narrow crowns—characteristics to satisfy even the most discriminating spruce buyer.

better trees through cultural work

Twenty years ago, most Christmas trees were wild-grown firs. Nowadays a Christmas tree may still originate in the forest, but it is more likely to come from a Christmas tree plantation. In these plantations, new trees—like any

man-grown crop—are planted each year to replace those harvested.

Trees can be given more exacting care in plantations than in the wild. When planted carefully in soil that is properly firmed and provided with shade both during the growing and dormant seasons for its early stages, seedlings should grow straight and tall, according to Forest Service Research Forester Raymond E. Graber of Durham, N.H.

In the tree plantation, weeds can be controlled to reduce competition for the growing trees. And trees can be shaped by electric or gasoline-powered shears, or by hedge clippers and knives, to produce the most appealing forms. Studies by Forest Service researchers

Plastic netting, applied by a simple device, holds trees and protects limbs from damage during shipment.









in Berea, Ky., show that chemical growth inhibitors may soon allow spray pruning to replace hand or mechanical clipping.

After six to ten years of knowledgeable attention in the plantation, Christmas trees are ready for sale. When they are cut, the trees are either wrapped in plastic netting or bundled with string and sent off to market. After cutting, trees require continued care, so they will remain fresh for holiday use. Since lost moisture cannot be replaced, too early cutting and hot, dry storage must be avoided.

There are a number of programs designed to help Christmas tree growers get the best trees to market. One such program in Pennsylvania is the Pennsylvan Tree Improvement Project. Sponsored by the Pennsylvania Christmas Tree Growers' Association and Penn State University, this Project provides information to growers on the best kinds of currently available tree varieties through its Penn-Sylvan Stock Buyers' Guide. The program also helps growers improve available stock through selection and breeding.

Since 1969, Pennsylvania growers have been asked to alert the Project to phenotypically superior specimens in their plantations. Project personnel then evaluate candidate trees for color, form, growth rate, stem straightness, and disease resistance.

Douglas fir and Scotch pine are receiving the most attention in the program at present.

competition: the artificial tree

The first mass-marketed artificial tree appeared on the holiday scene in



Mechanical shearing may soon be replaced and the attractive shape that shearing helps produce will be accomplished more easily by spray applications of growth inhibitors.

the early 1940's. Made of rayon visca, it was neither attractive nor popular, but it stimulated the manufacture of many other types. Today there are trees made of molded plastic, aluminum, and polyvinyl chloride. The "PVC" tree has captured 80 to 90 per cent of the artificial tree market, which this year alone will tally sales of 4 to 6 million trees.

Forest Service Economist Thomas H. Pendleton of Princeton, W.Va., feels that the widespread popularity of artificial Christmas trees can be attributed to aggressive advertising campaigns by their manufacturers. He feels that the natural tree can recapture its lost part of the Christmas tree market, as growers and retailers of natural trees be-

come more market-conscious and as trees themselves improve in quality.

According to Lawrence D. Garrett, who heads Forest Service economics research in Burlington, Vt., fire codes that prohibit natural trees in public places and multi-dwelling units have hurt the natural tree industry. If natural trees are coated with fireproofing substances to make them more fire resistant and if laws are amended, Garrett feels certain that real trees will again compete with artificial trees in safety features.

It is difficult to flameproof Christmas trees at present, because the only flameproofing solution that meets the standards of the Underwriters' Laboratories can be washed off by precipitation. This makes it quite impractical, since most trees are sold on outdoor lots where they are constantly subject to the washing action of rain and snow. But several firms are working to develop flameproofing solutions that will not wash off.

environmental considerations

Nearly 40 million natural Christmas trees are cut each year. Yet, cutting them cannot be considered a waste. Waste only occurs when more trees are cut than there are customers for. One of the jobs of economists at the Forest Products Marketing and Utilization Laboratory in Princeton, W.Va., is to keep ahead of Christmas tree buying trends in order to balance supply and demand and to reduce market uncertainty and tree waste.

Tree cutting is good for the forest environment where the trees grow. If a tree is not cut when it reaches a certain size, it will crowd out other trees. Once harvested, it no longer competes with its neighbors for moisture, soil nutrients and sunlight, and thus its removal promotes their growth. In a forest, remaining trees can be used for timber as they reach maturity.

After holiday use, real trees can be reused. They are beneficial for landfill and beach stabilization; they can also be useful as bird feeding stations, snow fences, and flowerbed mulch.

Digging a tree, then balling its roots provides some alternative for those who oppose Christmas tree cutting. Although there are problems with this practice, it does offer rewards for those who provide painstaking care. Because the balled tree can be planted outdoors as landscaping, its life and usefulness can be extended beyond service as a Yule tree.

There is a story that Theodore Roosevelt, an early conservationist, was so adverse to cutting evergreens for Christmas that he forbade their use in



Scotch pines (I. to r.): French, Domestic (seed source unknown), and Riga (from Northern Poland).

the White House. When his sons, Archie and Quentin, smuggled a tree into Archie's room, the President sought the advice of Forest Service Chief Gifford Pinchot, his friend and conservation advisor. Pinchot (who was from Pennsylvania) responded that proper harvesting of Christmas trees was good for forests and listed some of the same reasons given above.

Since then the White House has had an indoor tree every Christmas. And probably always will in the future. No doubt it will be better than those of the past, as there will be better ones for all the children of our Nation, thanks to forestry research.

christmas trees and air pollution

Sulfur dioxide, fluorides, and ozone are the major tree despoilers; individual trees respond differently according to location, species, genetic make-up, and stage of growth. If you plan to grow your own Christmas trees, you should look for nearby pollution sources since the proximity of the source and concentration of the pollutant, as well as duration of the pollution onslaught, can be crucial.

Air pollution can injure conifers more severely than hardwoods. Because pollutants attack foliage, they can cause conifers to lose their year-round needles prematurely. Without needles, and the ability to maintain normal food-production levels, trees become weakened and vulnerable to a host of insects, diseases, and other environmental stresses. Death often follows.

Dr. Leon S. Dochinger, a Forest Service plant pathologist in Delaware, Ohio, has compiled a list of tree responses to various pollutants. He urges nurseries to test their seedlings for responses to these pollutants before outplanting to insure the identification of problems before tree stock is distributed. This list is available through the USDA Forest Service or PHS.

buying and caring for your tree

To insure the best possible tree at home, plan to care for it properly once you've bought it. Here are some tree buying and handling tips:

- Select a tree that is fresh and green. To test for freshness, bend a needle and check its resilience. Bump the base of the tree hard on the ground to be sure the needles won't fall. (Some species—spruce, for example—do not retain their needles very well. This is characteristic of the tree and does not necessarily reflect a lack of freshness.) Finally, feel the bottom of the stump to make certain it feels sappy moist.
- Store the tree outdoors before use and conserve moisture by keeping it in a spot that is sheltered from sun and wind.
- To facilitate water uptake, cut an inch off the butt end before placing the tree in a stand. Use warm water in the stand initially.
- Water the tree daily while it is in the house. A tree can absorb a pint to a quart of water a day.
- Avoid placing the tree near heat sources that might cause the water to evaporate from the tree too quickly.
- For safety, keep flammable materials away from the tree and do not place lighted candles on the tree. Always check lights and wiring for worn spots and cracks before use, and do not overload electric circuits.

caring for a balled tree

Balled trees should only be kept indoors for as short a time as possible. Enclose the burlap ball in plastic to conserve its moisture.

It is wise to have your planting site selected and your hole dug before the holidays. This hole can be kept open by filling it with mulch material that does not freeze.

To further conserve moisture after planting, continue to protect a new plant with shade. Polyvinyl chloride in an aerosol suspension can also be sprayed on the needles to close off some needle stomates and to slow moisture loss through evapotranspiration.

flower show trees

Q. My husband and I enjoyed the Flower and Garden Show...and were enchanted by the displays. However, upon arriving home and pondering what we had seen, my conscience began to bother me. I'm disturbed when I think of the large specimens which were cut or uprooted to be displayed. What is done with these plants when the Flower Show is over? Was it necessary to use such large specimens? Did the displayers not consider carefully when they chose a specimen that can't be replaced in the ground? Is this being ecology-minded?

Perhaps the Society should discuss this problem, and set a policy for the future to use only balled and burlaped specimens that can be planted after the Flower Show.

P.M.B., Telford, Pa.

A. Most of the plant material used in the major exhibits at the Flower and Garden Show is living and is loaned by nurseries or private gardens. Even much of the large material that you may have thought cut is actually balled and burlaped. Some of the material will droop or wilt during the show; however, once it is placed back outside it quickly recovers.

Some cut material is used, especially in wooded scenes. It is, however, carefully selected and most often is taken from areas to be cleared or thinned. The large wooded scene that Fairmont Park had in the 1972 show was constructed with trees that came from a subdivision in the Northeast section of the city, from trees that were cut to make room for widening the expressway. The trees used in the Horticourt, the show's central exhibit, and the aisle trees were from a nursery in the King of Prussia area that was clearing out a lot of overgrown nursery stock.

The Pennsylvania Horticultural Society, along with the other exhibitors, is ecology-minded and would never deliberately destroy any plant for the sake of a show.



by Ed Lindemann, horticulturist

digging for information

HORTICULTURAL CORRESPONDENCE

overwatering

Q. I thought perhaps you could help me with my rubber plant.

After getting spots, its leaves eventually yellow and drop. It seems to spread from leaf to leaf and trunk to trunk.

K.S., King of Prussia, Pa.

A. There appears to be no sign of disease or insect trouble on the leaf of your *Ficus elastica*. The leaves of the rubber plant usually have a life span of no more than two years. Before the older leaves die they often start to spot and then turn yellow. Losing an occasional leaf this way is quite normal.

The type of marks that appear on your leaf may be the result of overwatering. If you are losing an excessive number of leaves, try watering the plant a little less and see if that solves the problem.

weaving hedges

Q. In Ms. Ballard's article in the July issue of *Horticulture* ("Philadelphia's 18th Century Garden") she mentions the woven hawthorne hedges. If you have any borrowable references on this procedure, I would appreciate it if you would mail them to me.

A.L.S., Wilmington, Del.

A. Actually the procedure is quite simple the way I do it. In the spring when the new growth starts, rather than trimming it right away, I allow shoots to grow two or three feet in length. This causes the hedge to be unsightly for several weeks. After the shoots have reached this length I then weave them inward toward the center of the hedge both on top and on the sides. I continue this process throughout the season whenever I notice a new shoot sticking out. I find that I have to go over the entire hedge approximately three times during the summer.

I must warn you that after each weaving session you will come away looking as though you have been in a cat fight. It is not one of the more enjoyable jobs in gardening; however the results are rewarding especially after the leaves have dropped and the twisted patterns of twigs are visible.

chlorosis and dieback

Q. Enclosed please find a few leaves that you requested from my rhododendron plant that I described this morning on the telephone. The young leaves from around the new buds are curling and seem limp.

I checked and the plant does not appear to be sinking in the ground.

Mrs. J.S., Marlton, N.J.

A. One problem that is affecting your plant is chlorosis. This is common when the plants are growing in alkaline soils or planted near a cement wall. Under alkaline conditions the plants are unable to absorb iron and thus become chlorotic. To control chlorosis you may treat the soil or spray the leaves with an iron chelate. Avoid using lime near this type plant and do not place them too close to cement or brick walls.

The curling of the tip leaves is not a sign of chlorosis; however, I believe it is a type of dieback. With dieback, terminal buds and leaves turn brown and roll up and often droop and resemble the plant in a winter condition. This problem is caused by a fungus. To control the problem all diseased tips

continued

sick lilac and healthy hibiscus

Q. I would like to fill out the form you mentioned in the first issue of *The Green Scene* because I have a problem with my lilac bush. Also would you please give me pointers on keeping a hibiscus plant healthy? I've had it for four months now and it has bloomed profusely, but I don't know what to feed it. It is in a small plastic pot which seems too small. The plant is about two feet tall and has two branches. Should I repot it? It seems to require lots of water. Is this normal? Should it be watered from the bottom tray?

A. The form mentioned in the Sept./ Oct. issue is only to provide us with taxonomic information needed for plant identification. If I understand your letter correctly you already know that the plant is a lilac and you are concerned with a problem affecting the plant. Lilacs suffer a great deal with powdery mildew, especially during hot humid periods. If this is the case, the leaves appear to have a white powder or mildew-like covering on them. The best control for powdery mildew on lilacs is to spray with wettable sulfur. If you feel that your lilac is suffering from something other than powdery mildew the best thing to do is send me a specimen of the plant. To prevent drying out in the mail, it is best to place the specimen in a small plastic bag such as a lunch baggie and enclose a damp paper towel.

The hibiscus plants flower sporadically through the fall and winter, so you can expect to have some bloom. However, the plant will not flower regularly as it did in the spring and summer. I suggest that you water the plant with a soluble fertilizer manufactured for potted plants. Follow directions on the package.

Do not fertilize during November, December or January. You mention that the pot your plant is in seems too small. I would suggest that you move

the plant from a plastic pot to a clay container and to one that is large enough to provide plenty of room for the roots. This will keep the flower buds on the bush. I would assume that since you have had such good luck with the plant in the past that you are watering it properly.

lacebug

Q. Enclosed are the azalea leaves I called about. Can you tell me what is killing these plants?

Mrs. C.E.S., Wynnewood, Pa.

A. Your azalea bushes are suffering from a pest that is quite common to azalea known as lacebug or lace fly. These insects hatch out in May and the young feed on the undersides of the leaves. They seldom cause the death of the infected plant. To control the insects, spray plants with malathion, especially the undersides of the leaves. Repeat sprayings throughout the summer and fall as the lacebugs appear. From the general appearance of your azalea specimen, I think that your plants need to be fertilized. I suggest

vou use an acid fertilizer.

classified ads

Wanted. Cutting of *Passiflora caerulea* from plant originally purchased at Valley Gardens. E. D. Ballard. WA 2-4801.

FOR SALE: Large variety of unusual and rare plants for house or greenhouse. Call TU 4-0498.

Perennials—the usual and unusual. The Rustic Gardens, Route 413, Gardenville, Bucks County, PA (just 4 mi. north of Buckingham) invites you Thursdays, Fridays, Saturdays for a fine selection of perennials, wildflowers and herbs.

Upper Bucks Stone Farm Residence. Estimated professionally, built 1740. Historic, insulated for electric heat, eight rooms, 2½ baths, fireplace, 24 × 24 masonry garage, finishing details await buyer's choice. Naturally rustic, secluded, convenient, clear and woodland acreage optional. Reply Dept. GS-100, *The Green Scene*.

Exchange Registry — members of associations are being invited to subscribe to our national home exchange directory. Write for brochure: Interchange Connexion, Washington Crossing, PA 18977.

AFRICAN VIOLETS. African Violet color catalog send 20¢. Greenhouses open daily and Sunday afternoon. We carry full line violet accessories, pots, violet jars, terrariums, fluorescent lighting equipment. TINARI GREENHOUSES, 2325 Valley Road, Huntingdon Valley, PA 19006. Dept. T

Fern Hill Farm, Jessup Mill Road, Clarksboro, NJ 08020 offers a limited supply of Dr. Harold Martin Pole Lima Bean seeds, \$1.00/pkt. (12 seeds) +254 postage per order. Shallots organically grown, $854/\frac{1}{2}$ to $\frac{3}{4}$ lb. +654 postage per order.

Jerusalem Artichokes organically grown 60¢/lb. + 65¢ postage per order.

ROSADE BONSAI STUDIO. Bonsai, trained plants, containers, supplies, books, turntable. Saturday Workshops. Open Saturday or by appointment. Box 303, Ely Rd., R.D. 1, New Hope, PA 18938. Telephone (215) 862-5925.

For sale to best offer. Antique wire flower pot stand, three-tiered, on rollers. 42" high, 36" long, 22" deep. Never painted. Good condition. Call (215) NI 4-3728.

Advertising copy should be submitted 8 weeks before issue date: November, January, March, May, July, September. Minimum rate \$5.50 (covers up to 35 words). Additional words 20¢ each. Less 10% discount for two or more consecutive issues, using same copy. All copy should be accompanied by check made out to PENNSYLVANIA HORTICULTURAL SOCIETY and sent to Patricia M. Cain, THE GREEN SCENE, 325 Walnut Street, Philadelphia, PA 19106.





John Briggs rates horticulture next to music in his scale of preferences. Author of several books, he is best known for *Leonard Bernstein*, the Man, His Work and His World (World Publishing 1961) and Requiem for a Yellow Brick Brewery (Little Brown 1969), a story about the old Metropolitan Opera. From 1963-71 he wrote the program notes for the weekly Philadelphia Orchestra concerts. Briggs gardens in Merion. He has been a member of PHS since 1966.

THE LONG LIFE OF THE POINSETTIA BRIBE

Everybody knows you shouldn't bribe a newspaperman. But with holiday spirits in the air, no one would have dreamed of sending back the two handsome poinsettias that arrived at my desk last Christmas.

The poinsettias arrived—one of them actually five plants in a single container—and all in spectacular Royal Canadian Mounted Police-tunic bloom.

They were so spectacular, in fact, it seemed almost a pity to take them home. It had been my experience that the life expectancy of a Christmas poinsettia was somewhere between 4.5 and 7 days, depending on how conscientiously it was kept watered.

The reason, as we all know, is that the temperatures at which we keep our homes in winter are just a bit higher than plants really enjoy. Dry air compounds the problem. And poinsettias seem to be one of the most vulnerable to the man-made desert climate we maintain indoors.

Looking at the spectacular blooms, I had an inspiration: This year, how about trying the sun porch for a change?

It's a typical one-story structure, facing east, south and west and sheltered from the north winds by the entire width of the house. Two radiators take off some of the chill, but because of its large area of uninsulated glass, it's always about 10 degrees cooler than the rest of the house. From October until spring, except on mild, very sunny days, the sun porch isn't really comfortable without a sweater.

The spot I chose for the plants, mainly because it was the only flat surface that wasn't (a) directly above a radiator or (b) covered with books and records, was the top of a bookcase facing two south windows. I put the poinsettias there and placed a dozen ice cubes around the roots of each.

I realize this sounds mad. All the books say you should never, never put ice water on plants. I had done it that way, however, ever since I first discovered via pachysandra the pleasure of growing plants indoors during the dreary winter months.

My reasoning was that the ice cubes would cool the soil surface, if not the air, and would release water in a gradual soil-permeating trickle rather than making a mudpie that would later cake.

I have since concluded pachysandra is about as gardener-proof as a plant can get. Nevertheless, since the first ice cubes worked, I have used them ever since.

The next day I looked at the poinsettias, half expecting icicles to have formed. They looked fine. They also looked fine the next week, and the next, and the week after that.

After about six weeks the refusal of the plants to fade, wither or shed their brilliant scarlet leaves began to seem almost ominous. I had never heard of a Christmas plant lasting that long. I called The Pennsylvania Horticultural Society to see what else, if anything, should be done.

The reply of PHS was succinct and specific: "Keep them watered and keep your shirt on."

By now the plants were putting out vigorous new growth. Bright scarlet pinpoints appeared at the tips of branches, gradually developing into full-sized blooms. Stalks sent out vigorous green runners that crowded their way to the south window; the plants seemed as sun-hungry as a sunflower.

It wasn't until the first week in July that the brilliant reds began fading and dropping, suggesting the plant might be going into its dormant stage. Then what? I decided to keep watering and see what happened.

About then the July issue of *Horticulture* arrived. The column headed "Things to do this month" began with a note that July is the time at which commercial growers customarily start new cuttings of poinsettia.

Ah, my next project. Now, let's see how do you make a cutting? The poinsettia was introduced into the trade by Robert Buist who was a member of PHS. Horticulturist Buist was an active member who introduced many new and rare plants at the Society's shows. He served as treasurer and vice-president of the Society between 1830 and 1875. We're proud of this!

Don't Be Misled By Labeling On Plants

Last March the Agricultural Experiment Station at the University of Maryland sent out a news release chiding the label-makers in the retail floral trade for not informing themselves sufficiently about plant care. They said:

"Most floral shop label instructions, textbooks and gardening brochures advise that you should stop watering a poinsettia when it is through blooming and store it in a cool, dry place after the leaves fall. Then in April or May it should be repotted, pruned back to six or eight inches in height, watered liberally and set outside for the summer.

"But Dr. James R. Shanks, professor of horticulture at the University of Maryland's College Park campus, warns that subjecting long-blooming modern poinsettia varieties to such a dormant period at this time of year could well kill the plants.

"Dr. Shanks recommended in a recent interview that modern poinsettia plants be watered and kept alive indoors until minimum outdoor temperatures reach 50-55 degrees F. Then they can be repotted, trimmed back to the recommended length, plunged into the ground and left outdoors until mid-September.

"The poinsettia plants should be fertilized every three to four weeks with a liquid-soluble fertilizer and trimmed once or twice during the summer to induce branching."



photos by Edmund B. Gilchrist, Jr.



terrariums for all ages

Giving a plant or something you've made adds to the meaning of Christmas. If the gift combines the two it becomes extra-special. Making terrariums for your family or friends will bring to their windowsills a bit of the year-round cheerfulness produced by green growing things. And it's a pursuit you can enjoy whether you are eight or 80.

A terrarium is simply a plant or a collection of plants in a covered glass container. Once planted it becomes a self-contained environment, providing

the moisture, light and correct temperature needed for good plant growth.

Start planning and planting your terrariums at least a month before you plan to give them. Careful selection of the plants and planting medium, correct watering and suggesting the right place to put the terrariums will ensure that you are giving many months of enjoyment.

Decide how many terrariums you want to make and then collect your containers. My own collection of ter-

rariums includes an old fish bowl, a quart size peanut butter jar, an antique water bottle, a brandy snifter and a small bell jar covering a pyrex dish. The requirements for the container are easily met. It should be clear or light-colored glass (plastic can be used but scratches easily and is generally more expensive than glass). It should be large enough to hold 2"-3" of planting medium and the plants. It should have a cover. Screw-on lids, pieces of glass cut to fit, old clock faces or pieces of plastic wrap secured by a rubber band all make good tops.

Once you decide on the containers it's time to think about the plants for your terrariums. Here are a few suggestions to keep in mind. First, consider the environment. The plants should be the kind that can tolerate humid conditions and don't need direct sunlight. Their rate of growth is important. Miniature and slow growing plants are best. Next, decide whether you are going to collect the plants from nearby woods or buy them. Collecting suitable material from woods is impractical for most of us. With the increasing emphasis on preserving our natural areas, it may be best to buy the plants. If you want to grow woodland plants in your terrariums there are nurseries that specialize in wild plants for terrarium culture. Mosses, lichens, ferns and low growing ground covers are recommended. Because they normally grow out-ofdoors, woodland plants need a light and cool place in your house if the terrariums are to last more than a few months. That is why miniature and slow growing tropical plants are probably your best choice. These plants come from the tropic and sub-tropic areas of the world and will thrive for a long time in an enclosed container. Also, they are more readily available in local greenhouses or mail order nurseries. Recently they have begun to appear in 5 & 10¢ and variety stores. The following are among my favorite plants for terrariums:

tree-like dwarf euonymus pilea polyscias

flowering miniature African violets miniature gloxinias

miniature gloxin ground covers selaginella baby's tears miniature creeping fig

small foliage peperomia small leaved begonias prayer plant tropical ferns

Moss from a shady spot in your yard or

terrarium books

The Victorian Fern Craze; A History of Pteridomania by David Elliston Allen, Hutchinson, London, 1969.

Gardens in Glass by Mildred Norton Andrews. A. T. De La Mare Co., New York, 1934.

Bottle Gardens and Fern Cases, with illustrations by N. Creina Glegg, by Anne Ashberry. Hodder and Stoughton, London, 1964.

Gardens in Glass Containers by Robert C. Baur. Hearthside, New York, 1970.

Gardens under Glass: The Miniature Greenhouse in Bottle, Bowl, or Dish by Jack Kramer. Simon and Schuster, New York, 1969.

If you can't find the materials you want for your terrarium, call Julie Morris, PHS horticultural librarian. She will recommend some area nurseries that carry them.



found growing in the cracks of a sidewalk is also a good ground cover. Pick up some interesting small stones and a few pieces of tree bark to use in your landscaping.

After you've selected the container and the plants, start assembling the materials needed for planting. These are potting soil, aquarium charcoal, decorator moss, sand or perlite, and bird gravel. (All available at variety stores.) Paper towels and a small artist's brush may come in handy.

making the terrarium

- 1. Line the bottom of the container with moistened decorator moss or moss you've collected, the green side against the glass. Put a ½" thick layer of charcoal to keep the soil fresh and add a few pebbles or a small handful of sand for drainage.
- 2. Next put in about 2" of potting soil mixed with a little sand or perlite. This makes a planting medium that is light and porous.
- 3. Add some of your stones and pieces of bark to create a natural, woodsy landscape. Push them slightly into the soil so they are partly covered. This will give the terrarium some hills and valleys so more plants will fit, and the

design will be more interesting.

- 4. Put the largest plants in first. Fill in with smaller foliage and flowering plants. Add some of the ground cover and moss.
- 5. You can make a path or simulate a pond by arranging some of the bird gravel with your paint brush.
- 6. Deciding on the right amount of water is probably the hardest part of planting the terrarium. The soil should be evenly moist but not soggy. Because there is no drainage hole, it is important not to overwater. If you do have a flood on your hands, however, make a wad of paper towels and soak up all the extra water. Generally ½ cup of water is enough to add to a quart size container. You should see water on the sides and bottom of the container but not on the top of the soil.
- 7. Once you decide that it all looks really great, wipe any stray soil from the sides of the container and put on the top. If the cover is the screw-on type, only give one turn so that some air will get in. If the top is glass put a tiny piece of clay between it and the container and if you are using plastic wrap, make some pinholes in it. A little air is necessary to keep the atmosphere from getting stale.

As long as there is moisture on the sides of the containers you won't have to add any water. Some of my terrariums are watered only twice a year. Put the terrariums on a windowsill or near a window that gets good strong light or filtered sunlight. Too much direct sun will cook them.

To ensure the continued good health of the terrariums, you could give a list of instructions for care with each gift and if you can, list the plants. Your list of requirements for terrarium care will be simple.

- 1. Placement near a window with good light or filtered sun.
- 2. Watering add water when moisture no longer appears on the inside of the glass. Moisten thoroughly but don't flood.
- 3. Landscape maintenance suggest that the cover be removed for one day each month; dead leaves and flowers should be removed and overgrown plants trimmed.

The tiniest plant needs the same balance of air, water, light and temperature as the mightiest tree. Watching the daily changes in the gifts you've made will bring gentle joy to your friends throughout the year.



The Pine Barrens region of New Jersey, noted for its botanical lore and its unique wild charm, produces annually several million pounds of brilliant red, tangy cranberries. The cranberry bogs which yield this delightful fruit are located in such out-of-the-way places as Hog Willow, Double Trouble, Otter Pond, Ugly Lake, Friendship, Boo Coo, Retreat and Bear Swamp. Although the site is backwoods, growing cranberries is complex and involves a sophisticated technology. Problems brought about by diseases, insects and

NEW JERSEY CRANBERRY BOGS:

good for



the green scene • nov. 1972

weeds had to be solved. Scientists at state experiment stations have studied cranberry production, and private industry has developed and marketed the products creating in the process a demand for cranberries. National consumption of cranberries increased from about eight million pounds in 1870 to about one hundred and seventy million pounds a century later.

New Jersey, the Garden State, was displaced as the second largest cranberry producer by Wisconsin around 1939 and it has stayed in third place ever since with Massachusetts still in the lead. Of the 1971 record national crop of 2,208,000 barrels (220,800,000 lbs.), Massachusetts produced 48%, Wisconsin 32%, New Jersey 10%, Washington 7%, Oregon 3%. The New Jersey cranberry crop has a gross value to farmers of \$2½ million to \$3 million. Almost all of the berries grown in New Jersey are processed at the Ocean Spray plant, a short haul away from the bogs at Bordentown. The added processed value brings the value of the crop to about \$12 million a year.

continued

Philip E. Marucci is a Research Professor in Entomology and Extension Specialist in cranberries and blueberries at Rutgers, New Jersey State University.

In photograph below, worker corrals cranberries after water wheel knocks them off vines. Once they reach the edge of the corral, an elevator of paddles and belts will carry the berries to trucks. They are then taken to a shed where they are cleaned and dried.

the goose and good for the environment



New Jersey, located close to the southern limit of the natural distribution of cranberries, has more serious growing problems than other states. The warmer climate and longer growing season foster a more intensive weed growth and more favorable conditions for crop-destroying fungus and virus diseases. Insect populations tend to be greater and the ruinous virus disease, false blossom, spreads rapidly only in New Jersey. Ironically, this disease was introduced into New Jersey from Wisconsin in 1915 where it is not important. By 1926 it could be found on every bog in the State. It spread like wildfire in New Jersey and just about destroyed the cranberry industry there. The presence of this uncontrollable disease, which rapidly debilitated the vines, demoralized many growers. Bogs were neglected and production was marginal. Cranberry bog acreage dropped sharply from 11,555 in 1925 to 5,000 in 1945. Acreage is now down to about 3.100

insects and diseases

In addition to disease, growers must also fight insects and weeds. Early in the history of cranberry culture four species of leafrollers invaded the bogs and caused such devastating damage to cranberry vines that they were given the descriptive name "fireworms." Some of the other destructive insects that have been important and which still cause economic losses in the State are cranberry tipworm, which prevents formation of flower buds, cranberry girdler, fireworm, cranberry scale, army worms and bluntnosed leafhopper, the vector of false blossom disease. Fruit rots caused by several fungi are serious threats which require control applications every year. Since cranberry bogs are not cultivated and hand weeding has become economically unsound, weeds present a special problem. The most plentiful and destructive weed is a sedge, Carex bullata. Other sedges, Panicum grasses, rushes (Juncus spp), red root (Lachnanthes tinctoria), bulbbearing losestrife (Lysimachia terrestris), briers (Smilax spp) and ferns (Anchistea virginica and Osmunda spp) are prominent and serious weeds.

To control insects and diseases almost all cranberry growers adhere to a rather moderate spray schedule. Four or five sprays per year are applied depending upon the severity of conditions. Usually at least three fungicide treatments (ferbam or maneb) and two or three insecticide sprays (guthion or parathion), one or two combined with fungicides, are needed. Cranberry and blueberry growers in New Jersey pioneered in the aerial application of insecticides. This is now the main method of application, Nonpersistent chemicals only are used and the last application, usually in late July, is generally about two months before harvest, assuring no residues. Weed control chemicals (caroron or dalapon) are used after harvest or when no fruit is present.

The existence of the cranberry crop in New Jersey today is a triumph. The false blossom scourge has been almost completely eliminated and rot diseases and insects are now well controlled. Throughout the false blossom years (1920-1945) production in New Jersey averaged only 10 to 20 barrels per acre. As recovery from false blossom slowly occurred, production went from nine barrels in 1940 to 32 in 1960. However, after Bill Haines introduced his harvester in 1960, production accelerated even further reaching a record 76 barrels in 1971.

about the plant

The commercial cranberry is known botanically as the large cranberry, Vaccinium macrocarpon. It is in the same genus as the highbush blueberry and a member of the heath family (Ericaceae) to which belong the familiar azaleas, rhododendron and laurel. This native North American plant is found in the wilds from Newfoundland west to Minnesota and south to North Carolina, Virginia, West Virginia, Ohio, Indiana and Illinois. Closely related are the small cranberry, Vaccinium oxygoccus, and the lingonberry, Vaccinium Vitis-idea, which is much relished by Scandinavians but not of commercial value in the United States.

The cranberry is a trailing evergreen vine. The vegetative growth, "runners," cover the ground and root where soil moisture is adequate. Perpendicular shoots, called "uprights," are produced above well rotted runners and they produce flower buds in the late summer. Blossoming occurs from early June to mid-July depending on the date of removal of the winter flood from the bogs. The blossom is an attractive, delicate structure with the

bell-shaped, whitish-pink, four-petaled corolla at the end of a long peticle two to three inches long. The long, graceful curve of the flower, seen in silhouette. resembles the neck of a crane and giving rise to the name of the plant, 'craneberry," eventually contracted to cranberry. In false blossom disease. the flower lacks the curve, and the otherwise normal-looking blossom fails to produce fruit. The flower is mainly pollinated by insects; the heavy, sticky pollen rules out significant wind dissemination. In New Jersey the use of honey bees is obligatory to insure good pollination and adequate commercial production.

F. B. Chandler and Irving Demonranville have listed fifty-six cranberry varieties grown in North America. Almost all of these were selected by keenly observant growers with the objectives of resistance to diseases and productiveness. Almost all of the acreage in New Jersey is planted to the Early Black variety, an early ripening berry of dark red color that is less susceptible to false blossom disease than the other cultivars. Only recently, hybrids developed by U.S.D.A. and Experiment Station breeders have been introduced and will no doubt eventually replace the wild selections. The hybrids are generally larger in size, more productive and of better dessert quality than the old wild varieties. Unfortunately, they do not attain the proper deep red coloration desired until too late in the season.

Like other heaths the cranberry plant is an acid lover. It thrives best in sandy, peaty soils with pH values ranging from 3.5 to 4.7. Growing cranberries require plenty of water. It is not an aquatic or semi-aquatic plant as is commonly thought, but it must have a wet, well-drained soil with the water level from 12 to 18 inches below the soil surface. To achieve this and to flood the bogs, an intricate system of ditches, canals, dams, sluice gates and reservoirs, and the rare skill of water management is involved. Flooding is necessary to prevent frost damage and desiccation of the vines in the winter. The low-lying bogs are much colder than the upland, and frost is one of the big threats to the crop. The bogs must be flooded in the winter, usually from about December 1 to about May 10. Since the evergreen leaves continually transpire, the vines would not be able

to obtain sufficient moisture from the frozen soil and would soon dry out, especially in windy weather. Snow cover is rarely sufficient to completely protect the vines all winter in New Jersey as it often does in some Massachusetts and Nova Scotia bogs.

From the time that winter flood is taken off the bogs in the spring, the cranberry growers, like other farmers, face a constant battle with natural elements before they can harvest the crop in the late autumn. Spring frosts are often the cause of poor crops. Flooding the bogs on frosty nights in most cases is a good preventive measure, but as the shoots or uprights become tender and approach the flowering stage the water can also be damaging. In these situations the grower must make the agonizing decision whether to chance the damage potential in the water or to chance the frost. He must also husband his water supply and not use it too early in the season with later frosts almost sure to come and replenishment of the reservoirs by rainfall uncertain. The Weather Bureau gives special consideration to the cranberry problem and makes cranberry forecasts each day in the frost season in the spring and fall. Since there is considerable variation in temperature from one bog to another, each grower must learn to interpret weather data and estimate minimum temperatures for his own bogs.

Fertilizer must be used with care on cranberries since they are easily over-fed and respond with a lush vegetative growth deficient in blossoms and very susceptible to rot disease. Annually only about 100-150 pounds of 16-16-16 fertilizer is applied, most often by airplane, usually in the spring.

The New Jersey Agricultural Experiment Station of Rutgers University maintains experimental bogs and a blueberry field near Oswego Lake in the heart of the cranberry growing area. Twenty one-half acre bogs are located here where Rutger's scientists conduct experiments in nutrition, growth regulators, plant breeding, plant pathology, weed control and entomology.

One of the scientist's main objectives is to develop biological and integrated biological-chemical insect control methods to reduce our reliance on insecticides.

ecologically unique

Conservation cranberry growing integrates well with good conservation principles. It is a unique type of farming which, excepting for the sophisticated horticultural practices and machinery used, might be described as "backwoods agriculture." All bogs must have large areas of headland to insure pure water. Large reservoirs must be built and maintained, usually at least one acre of water per acre of bog. For every acre of water in the reservoirs, the subterranean supply of water on many acres of adjacent land is greatly increased. This condition has a beneficial influence on wildlife. Destructive forest fires are also less likely in these areas.

The cranberry region in New Jersey is a unique ecological area that has charmed botanists and naturalists from all over the world and has been described as a vast underground reservoir, holding one of the nation's purest water supplies, all under sand,



Cranberry blossom (Vaccinium macrocarpon).

References:

Peterson, Cross and Tilden, *The Cranberry Industry in Massachusetts*, Mass. Dep't of Agriculture Bull. No. 201, 1968.

Anon. Mimeographed Reports of The New Jersey Crop Reporting Service, 1971.

Gleason, Henry A., The Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada, New York Botanical Gardens and Lancaster Press, 1952.

Chandler, F. B. and Irving Demoranville, Cranberry Varieties of North America, Univ. of Mass. Bulletin 513, 1958. where it is protected from pollution and atomic radiation. For generations cranberry and blueberry growers have virtually served as guardians of this region and have kept it free from industrial and real estate encroachments and their attendant adverse environmental effects.

Cranberry growers have been involved recently in preventing land uses incompatible with conservation and agriculture. They helped defeat the jet port interests in the Pine Barrens. Through their organization. The American Cranberry Growers Association, they worked with public spirited ecologists and conservationists to initiate interest and support for the recently-passed Assembly Bill 2096. The bill established a Pinelands Environmental Council charged with the development of a plan to protect natural resources, to prevent misuse of the land and to preserve and promote the horticultural complex in the region. The 15 Council members will have a pronounced horticultural orientation: members will include a cranberry grower, a blueberry grower and six mayors or their appointed representatives from six rural communities, with strong horticultural and agricultural leanings. This act may well establish a precedent for other land-use laws. (A cranberry grower, J. Garfield DeMarco, assistant to Assemblyman Barry Parker, the main sponsor of the bill, helped to write it.)

Fishing, hunting and camping around the cranberry bogs are favorite pastimes for many. The fact that there are several hunting lodges grouped around the cranberry-growing areas near Chatsworth attests to the popularity of this region to sportsmen. The cranberry reservoirs make good habitats for the blue herons, several species of ducks, Canadian geese and other interesting aquatic birds and are favorite haunts for bird-watchers. A surprising number of people are engaged in botanizing; professional and amateur botanists frequently come to the Pine Barrens to observe and collect the interesting flora found there. The plants and ecology of the Pine Barrens are so interesting that international botanical groups have toured the area. Photographers and artists also take delight in portraying cranberry bogs and other interesting features in their vicinity.

NATURAL MATERIALS FOR CHRISTMAS DECORATIONS, NATURALLY

Each year the Christmas season brings forth a wondrous array of beautiful decorations. Stores, business offices, parks, homes, schools, churches, flower shows and holiday house tours all provide a rich fare ranging from the simplest wreaths and swags to elaborate ornamentations. More and more, we see original and tasteful use made of natural materials, cones, pods and berries displayed against the rich greens of hollies and pines.

You can make smaller and more intimate decorations and table favors with just a small investment of time: thirty or forty minutes of gathering weed seeds and pods from the garden and roadside.

The ambitious decorator can pick up free, as late as December 24, delicate grasses, small cones and nuts, winter buds from trees and shrubs, berries and a myriad of wonderful shapes and forms left on the earth's surface after the birds have completed their harvest.

Wreaths, tiny trees, table favors, plaques, mistletoe balls and a candle bobèche (a disc to catch a candle's drippings) can easily and quickly be fashioned from such gleanings with the help of sharp clippers, scissors, tweezers and Elmer's glue.

Forms, the body around which you build your decorations, can be bought or made: styrofoam cones for trees, embroidery hoops for kissing balls, or any shape that can be cut from cardboard. It's a good idea to plan at an early stage how your decorations will be hung because your finished product will be brittle and somewhat fragile. Attaching a bit of ribbon or brass ring to the back before adding your plant material will suffice.

Whatever the chosen form, the method will be the same. The amateur tends to be too reverent and timid about starting. Don't be intimidated; let your-

self go. First, apply a thick layer of Elmer's glue over the surface to be decorated. Work on the overall design: place the larger plant material first. Create repetitive patterns, a strongline, a pleasant curve, or give weight to a dominant spot. Keep adding bits and pieces until the glue is completely hidden; keep the most interesting and fragile shapes in prominent spots. The slow drying quality of this type of glue allows ample time for adjustments. The depth of the plant material can change the character of the article from daintiness to lavish opulence. Check to see that no raw or unsightly edges mar your creations. An extra seed, leaf or grain will camouflage such spots. These additional pieces are easily and permanently added by dipping an edge or stem into the glue and applying with a tweezer. Occasionally your work will shift or slip a bit. Don't worry; just adjust with a slight push until you are satisfied with its appearance. Allow to set overnight. The glue not only will become firm but also clear and transparent. When working on a three-dimensional piece to be covered with natural materials, rest the finished side on crumpled paper towels. It will prevent chipping and breaking and will allow you to move materials around easily.

In closing I hope to leave one thought alone with you. Creating miniature bibelots is fun; anyone can do so. When gathering your material let your eye be the judge. I have listed some possibilities but don't waste time looking for specific things; use what you see. You will be surprised at the variety of shapes that are waiting to be discovered in the garden, a park, along the roadside or in the woods. While assembling, don't despair if your creation shifts about; all glue dries eventually. After the holidays are over, store away any favorites; unless you have a "hungry mouse in the house," your ornaments are surprisingly permanent.



by Joanna McQuail Reed

Joanna Reed is an ardent horticulturist who has several gardens at her home in Malvern: vegetables, herbs and flowers. She hopes to start a wild garden soon.

Ms. Reed is most proud of having attended the first sessions formed at the Barnes Arboretum in Merion.



Candle Bobeche

The bobèche is a bib of natural materials mounted on heavy cardboard to catch wax drippings from the candle. The circle I used for this bobèche is about four inches in diameter. I used seed heads of sedges and grasses, columbine (Aquilegia sp.), pinks (Dianthus sp.), and sumac (Rhus glabra). I also included the dried fruits of Japanese dogwood (Cornus kousa), alder cones (Alnus sp.); dried foliage of boxwood (Buxus sp.) and arbor vitae (Thujus sp.) as well as leather leaf viburnum buds (Virburnum rhytidophyllum) and small fungi found growing on a rotten log.

Mistletoe Ball

I've crossed two embroidery hoops and drilled holes at both intersecting points. One set of holes is large enough to accommodate the mistletoe stem. The hoops are firmly held at right angles with thin wire. I decorated with beech nuts (Fagus sylvatica), small mushrooms, fruit of the pieris (Pieris japonica), lavender leaves (Lavandula sp.), columbine (Aquilegia sp.), grass seeds and fruit from the stewartia (Stewartia sp.).



photos by Edmund B. Gilchrist, Jr.



paris, wire and four cardboard circles of varying sizes. My largest cardboard circle was seven inches in diameter. How many

circles you'll need will depend on the height of your tree.

The tree pictured here is 18" tall. The tree's center and anchor will be made with the thinner stake (about 1/2" wide). First, wrap a piece of wire around the stake leaving the ends of the wire sticking out at right angles to the stake. This should be done close to the bottom of the stake. Do this with about three

After the wires are wrapped around the stake, they are imbedded in the pot in plaster of paris. The stakes will weight the tree and hold it firm. After the plaster of paris dries, start building your tree alternating 2" or 3" segments of the larger bamboo, slipped over your tree stem (the narrow bamboo) with your cardboard circles. Be sure to glue each joint. The plant material can be applied to the cardboards before or after assembling the tree, whichever you find easier.

Some of the material used here are arbor vitae foliage (Thuja sp.), seed pods of St. Johnswort (Hypericum sp.), sumac (Rhus glabra), black-eyed susan (Rudbeckia serotina), acorns from oak (Quercus sp.), fruit from stewartia (Stewartia sp.) and cones from arbor vitae (Thuja sp.) and Virginia pine (Pinus virginiana).





A Flat Tree for Hanging

Here I'm using tweezers to add a bit of grass at the last minute to a tree hanging on our workshop door. The tree shape comes from a double cardboard backing stapled together. I added the hanger before the plant material was placed. The larger materials were glued in place first to give the tree its overall design: grasses, sweet gum (Liquidambar styraciflua), daffodil garlic (Allium tuberosum), sumac (Rhus glabra) and day-lily (Hemerocallis sp.). The smaller pieces were grasses, self-heal (Prunella vulgaris), globe thistle (Echinops sp.), black-eyed susans (Rudbeckia serotina), queen anne's lace (Daucus carota), and Japanese dogwood (Cornus kousa).

Christmas Tree Hangings

The extreme left and right hangings are made from parts of old Christmas cards that were glued back-to-back. Natural materials were mounted on both sides at the outer edges. The center ornament was done in silvery colored herbs to enhance the color of the tin can lid that served as a base. The herbs are silver king (*Artemesia albula*), Roman wormwood (*Artemesia pontica*), lavender cotton (*Santolina chamaecyparissus*), and flower centers from our lady's mantle (*Alchemilla vulgaris*) and camomile (*Anthemis nobilis*).

The circle on the left was done in tones of yellow and gold. I used dried boxwood leaves (Buxus sp.), grass seed heads and individual sections of golden yarrow (Achillea filipendulina). The diamond on the right is decorated with blossom parts of the cook's favorite, chives (Allium schoenoprasum). On the other side I used seeds of sweet cicely (Myrrhis odorata) and common garlic seed heads (Allium sativum).



books and the green world



Gardening is more than the growing of plants; it is the expression of desire. As there must be many gardeners, so must there be many books. There must be books for different persons and different ideals.

L. H. Bailey

The weeks preceding Christmas always bring these words of Liberty Hyde Bailey to my mind. Many people call the Library asking me to suggest books for Christmas giving. Trying to recommend a book for someone I don't know is a little like trying to identify a plant without seeing it.

One of the frustrations of suggesting gardening books as gifts is that they are often out-of-print. Another is that most people are admittedly last minute shoppers and find that only current books or the old stand-bys are available on the store shelves. If you have a friend with a passion for growing mangoes in an apartment and you can only find a book on lawns, you have a problem.

It may help you make a better choice if I share our thinking about some of the books we bought for the PHS Library. First, it's helpful to decide whether the book to be given as a gift will be ornament, a teacher, or a tool. By ornament, I don't necessarily mean the coffee table cliché. I do mean a book that embellishes its subject as fine garden sculpture enhances a garden. The book, *Imperial Gardens of Japan*, invites you into its pages of superb photographs. Little text is necessary; the pictures alone speak for the spirit of Japanese gardening and provoke a desire to look further into this finest of oriental arts.

One book that is both an ornament and a teacher is Carlton Lees' *Gardens, Plants and Man.* It is equally valuable for its text and photographs. Without the text, the photographs leave nagging questions: why the cornfield or the poppies? You find you want to read the text which in turn involves you in the pictures.

If you find a book that delights as well as teaches, grab it fast. Otto Friedrich promised himself a rose garden and *The Rose Garden* is a charming and hilarious diary of his progress from two rose bushes that quickly became "withered brown skeletons" to his triumph with a "citadel of roses, a fortress of tranquility." Along the way to his paths of glory we get many glimpses of the history of the rose and some unique suggestions for growing roses in the woods!

The Country Gardener by Josephine Nuese is an invitation into one person's garden and experience. Strolling through Ms. Nuese's garden is reminiscent of the times so



photo by Priscilla Greentree

many gardeners have spent with author-gardener Gertrude Jekyll over the past forty years. Dr. Josephine Von Miklos in *Personal Gardening* covers a wide variety of gardening tastes and techniques. She skillfully shows us how to adapt various gardening styles and make them work in our own garden. A big bonus in this book is the chapter-long bibliography on all phases of gardening.

Teaching books include something for minute-sized green thumbs too. Reading can be the first introduction people have to an appreciation of the green world. Hopefully this introduction takes place at an early age. The book *A Tree is Something Wonderful* arranges the meeting of child and plant in simple and unaffected language. Young readers can follow through photographs the miracle of trees starting from seeds through their entire life cycle.

Unless you are sure of the recipient's interests, don't give a "how-to" book. Rather show off your insight with something that's a little unusual. Rare Wild Flowers of North America, published by its author Leonard Wiley, has found favor with a number of local rock gardeners. For fifty years the author has collected and grown rare wildflowers. Most gardeners don't travel farther than their local garden center or nursery catalog. Wiley shares his experiences because he realizes that most of us will never have the privileges or opportunities he has enjoyed. He also writes for those who have the authority and experience needed to collect plant material in the wild. Many plants are described in detail.

Good horticultural literature can make us aware not just of the petals on our own petunias but of the whole scheme of plants and their relationship to man in a practical as well as an aesthetic sense. In *Reading the Landscape of Europe*, May T. Watts ties the landscape to the social and political histories of seven countries and unravels many mysteries with great style, common sense and wit.

Hundreds of books have been added to the Library's

If a book is relevant to the reader's interests, then perhaps it succeeds. Deciding whether information is presented in the best possible manner is our job. Giving a book demands a personal involvement with another's interests.

from the books

"In the final analysis it is every man who makes the difference. Every man at some point in his life should plant a bean so he will come to understand that it is necessary to his sustenance. He should plant a tree to learn that it is necessary to his comfort, and he should plant a rose to learn something of grace.

"Men make places, but places also make men."

Gardens, Plants and Man, Carlton B. Lees. Rutledge Book, Prentice-Hall, Inc., N.J. 1970. \$19.95.

"I wish my rose garden had a more formal style—not so precious as the Japanese or so arid as the French . . . I wish I had a brick wall . . . I wish like Churchill in his early retirement, I could build it myself All I have done is buy a bench If only I were André Malraux and had Versailles as my planting site, I might achieve something interesting."

The Rose Garden, Otto Friedrich. Lippincott, Philadelphia. 1972. \$3.95.

"Many people confuse a garden with a flower bed, thinking the two are synonymous A garden may include many flowers, a few or none at all A flower bed is a collection of blooming plants stuck in because the owner likes them and there couldn't be a better reason To me a garden is an area, or a series of related areas . . . its beauty lies in the subtle balancing of scale and proportion . . . the whole affiliated yet full of small surprises. . . ."

The Country Gardener, Josephine Nuese. Scribner, N.Y. 1970. \$7.95.

"Planet Earth is our home. We live here, and so do trees. The trees were here long before we were. We hope they will stay. We like trees, and we need them If you plant a tree now and look after it and help it to grow, living things you will never see or know will have reason to thank you."

A Tree is Something Wonderful, E. Cooper and P. Cooper. Golden Gate Jr. Books, California. 1972. \$3.95.

"I have never thought of wildflowers as ordinary plants A plant must have a great deal of character to thrive in a cliff crevice narrower than the thickness of a thumb nail . . . personality expresses itself during flowering time with a shower of blossoms Is it any wonder that the best of wildflowers are very much like the best of people."

Rare Wild Flowers of North America. L. Wiley. Oregon. 1969. \$12.50.

"If all the Saint-Francis preaching-to-the birds statues from American gardeners were to be carried on a pilgrimage to be blessed at the shrine of St. Francis of Assisi, the line of gardeners-pilgrims might stretch a long way up the western slope of the Apennines.... Unfortunately, there are no good statistics on American-garden Saint Francises, but as we climb the Apennines we can take pleasure in imagining such a pilgrimage of statuary—stone, cement, wood, plastic, with or without their commonly attendant garden flamingoes."

The sharp-edged tools of France...."It is hardly surprising that this land that is so compactly square in outline, that keeps its rivers almost entirely to itself, that painfully laid the egg of cubism, that shapes its countryside with three sharp-edged tools and has had its destiny continually shaped by a fourth sharp-edged tool, the sword, would be a land that pruned its rulers with the guillotine."

Reading the Landscape of Europe, May Theilgaard Watts. Harper and Row, N.Y. 1971.

We like to get involved and are committed to a regard for these interests. . . . Happy Giving!

The reason for mentioning so many books is that in one way or another, I have used them all, learned from them, had fun with them and often Inspiration.

J. Von Miklos, Personal Gardening

books for giving

Design:

Room Outside by John Brookers. Viking, N.Y. 1969. \$6.95.

Encyclopedia:

Wyman's Gardening Encyclopedia by Donald Wyman. Macmillan, N.Y. 1971. \$17.50.

General Gardening:

The Complete Gardener by Louis Wilson. Hawthorne, N.Y. 1972. \$12.95.

Illustrated Guide to Personal Gardening by Josephine Von Miklos. Prentice-Hall, N.J. 1972. \$9.95.

Fruit and Vegetable:

The Green Thumb Book of Fruit and Vegetable Gardening by George Abraham. Prentice-Hall, N.J. 1970. \$6.95.

Dwarf Fruit Trees Indoors and Out by Robert E. Atkinson. Van Nostrand-Reinhold, N.Y. 1972. \$7.95.

Gardens are for Eating by Stanley Schuler. Macmillan, N.Y. 1971. \$9.95.

Houseplants:

Garden in Your House* by Ernesta D. Ballard. Harper and Row. N.Y. 1971, \$6.95.

The Green Thumb Book of Indoor Gardening by George Abraham. Prentice-Hall, N.J. 1971. \$6.95.

Trees:

City Leaves, City Trees* by Edward Gallob. Scribner, N.Y. 1972. \$6.95.

Trees for Architecture and the Landscape by Robert Zion. Van Nostrand-Reinhold, N.Y. 1968. \$25.00.

Orchids:

Home Orchid Growing by Rebecca Northern. Van Nostrand-Reinhold, N.Y. 1970. \$18.00.

Cacti

Cacti and Succulents Indoors and Outdoors by Martha Van Ness. Van Nostrand-Reinhold, N.Y. 1971. \$7.95.

Flower Arranging:

Creative Design for Flower Arranging by Dorothy Riester. Van Nostrand-Reinhold, N.Y. 1971. \$8.95.

Pressed Flower Collages and Other Ideas by Pamela McDowall. Scribner, N.Y. 1971. \$12.50.

The Complete Book of Flower Preservation by Geneal Condon. Prentice-Hall, N.J. 1970. \$7.95.

Japan

Imperial Gardens of Japan by Takeji Iwamiya and Teyi Itoh. Walker/ Weatherhill, N.Y. 1970. \$65.00.

*On sale at Society headquarters.

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ilex cornuta and ilex crenata convexa

What is my favorite holly? To be objective one must set up criteria by which we make our choice.

I like a holly to have a good dark color, preferably a glossy leaf, and heavily fruited. I like to cut holly heavily at Christmastime and prefer one that is traditional and makes a good appearance in wreaths and decorations. Another factor to be considered is—how does it fit into the landscape picture?

With these points in mind my selection must consist of two hollies. One, *Ilex cornuta*, with its lustrous, dark green spined leaves, epitomizes Christmas. It is heavily berried and the fruit is a good red color.

Because of its beauty and versatility I chose *Ilex crenata convexa* for first place in landscaping. It grows to a height of approximately six feet and spreads somewhat less than that. Its leaves are close set on the twigs and are a dark glossy green, with an abundance of small black berries which the birds enjoy. There are many places in the garden where this plant can be used to advantage.

Care of these hollies is minimal. Any day in the latter part of February that is not too severe, I rake away the mulch and scatter Holly Tone generously over the ground to the tips of the branches and work it in very lightly if the ground is not frozen; I then replace the mulch.

Oak leaves are an ideal mulch, composted if possible; however, if heaped under the hollies the leaves will compost in time. Wood chips are a satisfactory substitute.

Judicious pruning is essential; this should be done before the new growth starts but may actually be done whenever one has the time, clippers and a holly in need of pruning. Their resistance to disease and insects are also factors that make these hollies favorites.

H. Rowland Timms





An amateur horticulturist, H. Rowland Timms says his interest in hollies goes back twenty years. He is at present growing 50 to 60 varieties of holly.

cyclamen neapolitanum

My choice of a favorite plant blooming in the early winter is *Cyclamen neapolitanum* because it can be absolutely guaranteed not to produce a "riot of color" in an otherwise beautiful garden. This plant is a charming miniature which breaks dormancy in September by producing bright, delicate, rose-pink, fragrant flowers on graceful, six-inch stems. These are produced in profusion through the fall and into December penetrating the early snows. The marbled leaves lie flat on the ground forming a neat rosette of variegated cover throughout the winter. Seeds are retracted underneath this foliage by an intricate and interesting coiling mechanism in the stem. In ideal culture they will self-sow but seeds are better grown in flats.

The cyclamens like shade and particularly need shelter from drying winds. They are fibrous-rooted and cold-hardy if planted only one inch deep and given a light mulch. A well-drained site is required in a loose, moist soil rich in peat or leaf mold. Since the tubers go dormant in the spring, new plants must be ordered early so that they can be shipped during this brief period of dormancy and planted in mid-summer.

C. neapolitanum is the easiest and most prolific member of this genus. Once established it is permanent in the garden, creating its own picture every year at a time and in a place that otherwise might be neglected. I would also suggest the culture of *C. repandum* which flowers from March through June and *C. europaeum* for bright, red summer bloom. Other species are more tender and of course more exciting to grow. The ultimate challenge is hybridization.

John D. Corbit, Jr.

photo by Roche



John D. Corbit, Jr., is a physician and amateur gardener whose special enthusiasm is dwarf plants, particularly conifers.

PLANT SOCIETIES

Most gardeners enjoy becoming experts in a particular area of horticulture or in the culture and development of a single genus of plants. Listed below are more than 28 national organizations which offer their members access to compre-

hensive knowledge in a single field of concentration; 18 of their local branches in the Delaware Valley area are listed. These groups meet regularly and welcome new members who share their special interest.

African Violet Society of America, Inc.

706 Hamilton Bank Building Knoxville, TN 37901 Frank Tinari 2325 Valley Road Huntingdon Valley, PA 19006 Membership \$6.00 per year includes 5 magazines yearly

African Violet Society (Philadelphia Center City)
Dorothy Sutton

8023 Terry Street
Philadelphia, PA 19136
Membership \$2.00 per year

Meet monthly every third Thursday except for November & December and July & August

John Wanamaker's, 13th & Market Sts., Philadelphia

African Violet Society of Springfield, Delaware County

Mrs. Samuel J. Bishop 345 Powell Road Springfield, PA 19064 Membership \$5.00 per year

Meet 1st Tuesday of month — September thru June Community Federal Savings and Loan Building 920 W. Sproul Road, Springfield

American Begonia Society, Inc.

1431 Coronado Terrace Los Angeles, CA 90026 Membership \$4.00 per year includes monthly magazine

Elsa Fort Branch Lola E. Price, Secretary 628 Beech Avenue Laurel Springs, NJ 08021 Membership \$4.00 per year

Meet once a month, except July-1st Saturday of month Homes of members

William Penn Branch Mrs. George E. Decoursey, President Mill Road Paoli, PA 19301

American Bonsai Society

Herbert R. Brauner, Membership Secretary 229 North Shore Drive Lake Waukomis Parksville, MO 64151 Membership \$10.00 per year includes quarterly journal

Brandywine Bonsai Society Mrs. J. F. Froning

Box 391, R.D. 3

Kennett Square, PA 19348

Membership \$10.00 per year - Individual

\$17.00 per year — Couple

Meet 10 times a year — 4th Saturday (spring & summer) 4th Thursday night (fall & winter)

No meeting December-August

Winter Meetings — West Brandywine Grange, Route 202, Wilmington, DE

Spring-Summer Meetings — Fronings, Rosedale Road, Kennett Square, PA

The Pennsylvania Bonsai Society
William Smedley, Secretary-Treasurer
419 Barday Road
Rosemont, PA 19010
Membership \$10.00 per year — Single
\$15.00 per year — Family

Meet as scheduled through the year

Wallingford Community Arts Center Bonsai Shop 414 Plush Mill Road Wallingford, PA 19086 Membership \$2.00 per year Meet once a month, usually 1st Monday of month Arts Center

The American Boxwood Society

Mrs. Andrew Kirby, Secretary-Treasurer Boyce, VA 22620 Membership \$5.00 per year includes quarterly bulletin

Cactus and Succulent Society of America, Inc.

Box 167 Reseda, CA 91335 Membership \$6.00 per year includes bi-monthly journal

Philadelphia Cactus and Succulent Society
Alan Singer, President
2100 Tremont Street, Apt. A6
Philadelphia, PA 19115
Membership \$1.00 per year
Meet 2nd Sunday of each month from September to June
Chestnut Hill Community Center
8419 Germantown Avenue, Philadelphia

The American Camellia Society

P.O. Box 212
Fort Valley, GA 31030
Joseph H. Pyron, Executive Secretary and Editor
Membership \$7.50 per year
includes yearbook and four journals

plant societies

National Chrysanthemum Society, Inc.

Mrs. George S. Briggs, Secretary 8504 Laverne Drive Adelphi, MD 20783 Membership \$5.00 per year includes quarterly bulletin

Delaware Valley Chrysanthemum Society

Wilbur G. Beck P.O. Box 41 Elwyn, PA 19063

Membership \$6.00 per year

Meet monthly — 3rd Friday at 8 PM (except Jan., July, &

First Federal Savings and Loan Association Front & Orange Sts., Media, PA 19063

American Daffodil Society, Inc.

89 Chichester Road New Canaan, CT 06840 Mrs. W. R. Mackinney 70 North Middletown Road Media, PA 19063 Membership \$5.00 per year includes quarterly magazine

Philadelphia Area Daffodil Society Mrs. Francis L. Harrigan, Secretary

441 Maplewood Road Springfield, PA 19064 Membership \$1.00 per year

Meet upon call, once or twice a year, blooming times (usually April and November)

Convenient places for luncheon meetings

The American Dahlia Society, Inc.

Caroline Mever 92-21 W. Delaware Drive Mystic Islands Tuckerton, NJ 08087 Membership \$5.00 per year includes quarterly bulletin

Greater Philadelphia Dahlia Society Mrs. N. L. Wright, Secretary 6926 Ridge Avenue Philadelphia, PA 19128

Los Angeles International Fern Society

Wilbur Olson 2423 Burritt Avenue Redondo Beach, CA 90278 Membership \$2.50 per year includes monthly fern lessons and annual yearbook

North American Fruit Explorers

Robert Kurle 87th & Madison Sts. Hinsdale, IL Membership \$3.00 per year includes quarterly bulletin

International Geranium Society

2547 Boulevard, Del Campo San Luis Obispo, CA 93401 Membership \$4.00 per year includes quarterly magazine

North American Gladiolus Council

H. Frederick, Membership Secretary 234 South Street South Elgin, IL 60177 Membership \$5.00 per year includes quarterly bulletin

American Gloxinia & Gesneriad Society, Inc.

Mrs. J. William Rowe, Membership Secretary P.O. Box 174 New Milford, CT 06776 Membership \$5.00 per year includes bi-monthly magazine

Delaware Valley Chapter Earl H. Elwell Central Avenue Audubon, NJ 08106

The American Gourd Society

P.O. Box 274 Mount Gilead, OH 43338 Membership \$2.50 per year includes three bulletins

American Hibiscus Society

James E. Monroe P.O. Box 98 Eagle Lake, FL 33839 Membership \$5.00 per year includes quarterly bulletin

Holly Society of America, Inc.

407 Fountain Green Road Bel Air, MD 21014 F. Harold Burr 142 Linden Avenue Greencastle, PA 17225

Membership: National - Personal \$5.00 per year Sustaining \$10.00 per year

> 1st year \$5.00, thereafter \$2.00 Local per year

includes newsletter and proceedings of meetings

Ikebana International

Philadelphia Chapter Mrs. Howard H. Rapp, President 431 Bolsover Road Wynnewood, PA 19096 Membership \$12.00 per year includes all regular meetings and two magazines from Japan

Indoor Light Garden Society of America, Inc.

128 West 58th Street New York, NY 10019 George Elbert, President 801 West End Avenue New York, NY 10025 Membership \$5.00 per year includes bi-monthly magazine

Philadelphia Chapter Under formation Contact PHS for information The American Iris Society

Clifford W. Benson, Executive Secretary

2315 Tower Grove Avenue

St. Louis, MO 63110

Membership \$7.50 per year

includes quarterly bulletin

Delaware Valley Iris Society

Albert E. Murray

70 Kraft Lane

Levittown, PA 19055

Membership \$1.00 per year

Meet 3 times per year in March, July and October; Garden

Tours in May

The North American Lily Society, Inc.

Fred M. Abbey

North Ferrisburg, VT 05473

Membership \$7.50 per year

includes quarterly bulletin

Middle Atlantic Regional Lily Group

William Happich, President

609 Linda Vista Avenue

Jenkintown, PA 19046

Membership \$2.00 per year

Meet 5 times per year - Jan., Apr., June or July, Aug., & Oct.

American Orchid Society, Inc.

Botanical Museum of Harvard University

Cambridge, MA 02138

Membership \$12.50 per year

includes quarterly bulletin

Southeastern Pennsylvania Orchid Society

Elinor Yocom

Box 148, R.D. 2

Chester Springs, PA 19425

Membership \$8.00 per year

Meet every 2nd Wednesday of each month, Sept. thru June

Clothier Auditorium of Bryn Mawr Hospital

The Palm Society

Mrs. T. C. Buhler

1320 S. Venetian Way

Miami, FL 33139

Membership \$10.00 per year

includes quarterly journal

American Peony Society

250 Interlachen Road

Hopkins, MN 55343

Membership \$7.50 per year

includes quarterly bulletin

The American Primrose Society

14015 - 84th Avenue, N.E.

Bothell, WA 98011

Al Rapp, President

4918 - 79th Avenue, W.

Tacoma, WA 98466

Membership \$5.00 per year

includes quarterly journal

American Rhododendron Society

Mrs. William Curtis, Executive Secretary 24450 SW Grahams Ferry Road

Sherwood, OR 97140

Membership \$7.50 per year

includes quarterly bulletin

The American Rhododendron Society

Philadelphia Chapter

Kenneth M. Miller, President

222 Bala Avenue

Oreland, PA 19075

Membership \$10.00 per year

American Rhododendron Society

Princeton Chapter

Dr. G. David Lewis, President

52 Glenwood Road

Colts Neck, NJ 07722

American Rhododendron Society

Valley Forge Chapter

Charles Herbert

County Club Road

Phoenixville, PA

Membership \$10.00 per year

Meet monthly, except July and August

Home of Charles Herbert, Phoenixville

American Rock Garden Society

Richard W. Redfield

Box 26

Closter, NJ 07624

Membership \$5.00 per year

includes quarterly bulletin

American Rock Garden Society, Delaware Valley Chapter

John S. Kistler, Chairman

1421 Ship Road

West Chester, PA 19380

Membership \$3.00 per year - Single

\$5.00 per year — Family

Meet monthly

American Rose Society

4048 Roselea Place

Columbus, OH 43214

Membership \$10.50 per year

includes monthly magazine

Delaware County Rose Society

Thomas E. Hare

418 S. Scott Avenue

Glenolden, PA 19036

Membership \$3.00 per year - Single

\$5.00 per year - Couple

Meet 8 PM last Monday of Feb., March, Apr., May, Sept.,

Oct., and Nov. June meeting a party in a member's garden.

Community Federal Savings and Loan Building

State & Sproul Roads, Springfield

Philadelphia Rose Society

J. Homer Smith, President

210 Williamsburg Road

Ardmore, PA 19003

Membership \$4.00 per year — Single

\$6.00 per year — Couple

Meet 1st Thursday of Mar., Apr., May, Oct., Nov., & Dec.

Pennsylvania Horticultural Society

325 Walnut Street, Philadelphia



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green Scene

HORTICULTURE IN THE DELAWARE VALLEY



house plants I couldn't leave behind

JANUARY FEBRUARY 1973







Cover:

article on page 4.











HORTICULTURE IN THE DELAWARE VALLEY

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In the September issue of The Green Scene, PHS horticulturist Ed Lindemann suggested using malathion to control white flies. As a result of this recommendation, a correspondence sprang up between Lindemann and M. M. Brubaker, a PHS member and a member of our publications committee. An organic chemist, recently retired from his job as assistant director of the central research department of Dupont Company, Brubaker took issue with Lindemann's recommendation, and we thought his argument was interesting enough to print.

Horticulture is a peculiar field; results often vary and what works well for one person or place often will not work for another. For this reason, we don't expect everyone to agree with everything that's printed in The Green Scene. Already, some of the people whom we most admire have questioned statements we've made. We feel discussion of disagreements are valuable and so we will, from time to time, publish opinion, either supportive or dissenting, when it is well thought out and well expressed, and when we feel our readers will benefit from the perspective. Here is Dr. Brubaker's opinion:

Malathion is recommended today for most pest control problems of the amateur gardener because (1) it was originally given a very low acute oral toxicity, (2) it is approved for a wide range of pests by the government, and those many pests are listed on the label, (3) malathion is not a trademarked name, and can be mentioned without fear of helping a manufacturer, and (4) it is not persistent.

The activist-inspired fear of chemicals and avoidance of pest control agents have been carried much too far. It is statistically clear that injury from pest control agents is insignificant in comparison with injury from toxins we voluntarily indulge in for recreation, like alcohol or nicotine, or even from chemicals like sodium chloride (table salt). Every person who dies from misused insecticides gets headlines across the country, but the more than 20,000 people who died last year as a direct result of misusing alcohol didn't seem to stir people up much. Smoking in bed killed hundreds of times more people than using insecticides, but there was no emotional national campaign on how to smoke in bed safely.

There just came in my mail the *Plants and Gardens* magazine of the Brooklyn Botanic Garden devoted to the home vegetable garden. Milton Savos, Extension Entomologist at the University of Connecticut, wrote the article on "Control of Insect Pests," and most of the other articles referred to it for information on pest control. He did not mention one single, practical pest control agent. He reviewed the ancient defenses like nicotine, pyrethrum, ryania, and sabadilla. He

went over the solutions of the activists, like ladybugs and praying mantises. He went over the same old precautions I have seen in just about every article on this subject coming my way in the last couple of years (he failed to caution against licking the fingers), but he didn't give a single bit of concrete advice to the gardener on how to take care of one of the many garden invaders. The pseudo-scientists and philosophers seem to have the authorities who write on this subject cowed. Home gardeners are more concerned about precisely how to control insects, mites, and plant diseases than any other gardening trouble, and the Pennsylvania Horticultural Society is in a position to give them great comfort in this matter.

Approval of the government and listing pests susceptible to the agent on the label doesn't necessarily mean it is effective or up to date. Spider mites are on the malathion label, too, and malathion is usually recommended to the home gardener for their control. However, malathion on spidermites is more likely to do harm than good because it kills only the adults, and the young quickly get used to it as they grow up. Instead of learning effectiveness from the label, it's better to ask someone who has to control the pest in connection with making a living.

Malathion is, indeed, nonpersistent, but I consider that a great disadvantage. Under most circumstances it has a half-life not in days but in hours. The plea for lack of persistence has been overdone. On nonresistant white fly, malathion must be sprayed very frequently and thoroughly or resistance builds up, which is usually the result of a simple recommendation of malathion to the home gardener. I just re-read the labels on malathion bottles at a garden center, and there was no mention of spraying every two days in fighting white fly. White fly was simply listed with a large number of other pests.

You asked how I combat white fly. On ornamentals I have used any one of a number of systemics, and have had no trouble controlling the pest. Fortunately, no resistant white flies have appeared here yet, and I'll do everything I can to kill them before they have a chance to get resistant. "Meta-Systox-R" is widely used by gardeners and can be obtained at most garden centers. It is the systemic component of "Isotox," and has a lower acute oral toxicity for rats than nicotine.

You suggested a fumigant for the advanced amateur or commercial grower. A fumigant can conveniently be used by the indoor gardener. Hanging a "Vapona" strip in a small enclosed space with the infested plant is quite effective (in a tight box, for example). Here again, for white fly, the treatment must be repeated frequently and for some time after the white fly has disappeared, because, as with malathion, there is no residual action. A lapse in treatment requires, in effect, starting at the beginning again.

M. M. Brubaker



by Ed Lindemann, horticulturist

jasmine

Q. Would you be good enough to send me instructions for growing jasmine as an indoor plant. I am particularly interested in the variety jasmine confederate.

Mrs. A.S.B., Andover, Mass.

A. Jasmine confederate is sometimes known as star jasmine and is not true jasmine at all but is known botanically as Trachelospermum jasminoides. This plant requires a sunny place to bear fragrant white or yellow star-shaped flowers. Normally a twining vine, it may be pinched so it will not need support. Do not allow night temperatures to fall below 50°. Pot in an allpurpose soil and propagate from cuttings in the spring and summer. The plant does not need to be repotted yearly, and it may take a couple of years to produce a plant large enough for a 4" pot.

leaf spot disease

Q. Please tell me what is wrong with my oak trees and what to do about it!

Mrs. G.A.H., Devon, Pa.

A. We've examined your plant specimen and have found evidence of several diseases attacking the leaves. Your leaves are primarily affected with one of the many leaf spot diseases that affect oaks. These diseases rarely cause any damage to the trees since they appear late in the growing season. The general control for leaf spot on oak is to gather and burn all of the fallen leaves. Or you may wish to use applications of copper or zineb sprays at two-week intervals starting in early spring when the leaves unfold.

The leaves you sent also show signs of galls. To control these, spray the trees in early spring, before the growth starts, with a dormant lime sulfur or with a

digging for information

HORTICULTURAL CORRESPONDENCE

dormant miscible oil to destroy some of the pests that have overwintered on the branches. Many of the galls that attack oak trees rarely affect the health of the tree; they do detract, however, from the tree's appearance.

tolmiea menziesii

Q. I have been offered a hanging plant; I don't know what it is. Can you please identify it for me (sample enclosed) and tell me whether it is an indoor plant? I live in an apartment with a northern exposure.

L.D.B., Philadelphia, Pa.

A. The plant that you are trying to identify is the piggy-back plant, known botanically as *Tolmiea menziesii*. It is a hardy ground cover plant, which is found from Alaska to California. The name piggy-back comes from the fact that new plants start on the backs of older leaves. It does well in either full or partial sun. Although the plant is hardy, it may be kept successfully as a house plant.

The specimen leaves that you sent show

easily be controlled by washing the foliage with a forceful water spray. The discoloration of the leaves may be due to poor drainage.

signs of red spider, which can most

materials for school children

Q. My class is very interested in flower growth. Can you please send us material on it or specimens of plants and flowers.

Mrs. P., Toms River, N.J.

A. I have enclosed several sheets of printed information on flowers, plants, and gardening that I hope will be useful. "Gardening with Children" should be of special interest to you. A visit to our library here at the Society might also be of interest.

Unfortunately, we are unable to provide you with plant or flower specimens. I would suggest perhaps a field trip to a local nursery or greenhouse for your class. There they will be able to see a variety of plants in different stages of development. To get flowers for the class to examine, it might be worth a telephone call to a florist in your area to see if it would be possible for you to get some old or discarded material.

Editor's note to teachers: For information about our programs for schools, contact PHS educational coordinator, Rick Fredette, by mail or phone (WA 2-4801).

rose care

Q. I stuck a piece of very beautiful pink rose (name unknown) into the ground about six weeks ago and it is showing new growth. It is exposed to winds (open sunny area); can you suggest winter care, please?

L.G., Ardmore, Pa.

A. The rose, which was propagated from a soft wood cutting, would best be overwintered in a cold frame. However, if you don't have a cold frame, I'd mulch the plant heavily with leaves or some other material. Once the weather gets cold and starts to freeze, place a covering over the cuttings. You can use a large jar or a frame covered with plastic. Either will provide ample protection during the winter. When spring arrives, uncover the plant and treat it as you would your other roses.

dieffenbachia

Q. Our adopted plant is having an identity crisis. We don't know what it is, nor do we know how to care for it. (Sample enclosed.)

J.A.L., Philadelphia, Pa.

A. The plant you are trying to identify is known botanically as *Dieffenbachia*. The common name is dumb cane, so named because the calcium oxalate in the stem causes a paralyzing irritation in the mouth and throat if chewed. Generally, *Dieffenbachia* is an easy house plant to grow. It does well in light or shade and needs temperatures of at least 70° or above. Since *Dieffenbachia* is a tropical plant, it requires fairly high humidity, plenty of water, and regular feeding.

A general rule to follow is to water the plant when the soil is dry within ½" from the top. It usually works out to about two or three times a week for plants kept in the house. The leaf specimen that you sent indicates that

your plant may be suffering from poor drainage. Make sure the drainage hole is not cloqqed.

Feed 'the plant with Miracle-Gro, following the directions on the package. Don't feed it in late fall, winter and early spring months. It's best to start feeding it regularly around March and continue through September.

defoliating thuja

Q. I've enclosed a piece of thuja for your examination particularly the back of the leaves. The tree, about 10 feet tall, is defoliating abnormally. I also enclose a dried brown piece—the part that is falling. Can you determine its disease and if it can be saved?

J.W.F., Wynnewood, Pa.

A. I can find absolutely no sign of either insect damage or disease damage anywhere on the plant. I am sure that the leaf drop that your plant is experiencing is completely natural. Below you will find a direct quote from the book entitled *Diseases and Pests of Ornamental Plants* by P. P. Pirone of the New York Botanical Garden.

Leaf Browning and Shedding. The older, inner leaves of arbor-vitae turn brown and drop in the fall. When this condition develops within a few days or a week, as it does in some seasons, many persons feel that a destructive disease is involved. Actually it is a natural phenomenon similar to the dropping of leaves of deciduous trees. When the previous growing season has been favorable for growth, or when pests,

such as red spider mite, have not been abundant, the shedding occurs over a relatively long period through the fall and consequently is not so noticeable.

Winter Browning. Rapid changes in temperature, rather than drying, in late winter and early spring are responsible for browning of arbor-vitae leaves.

blue spruce and gall

Q. As you requested I am sending you a few clippings of our blue spruce afflicted with gall. Please advise me as to what measures I should take to stop the disease.

Mrs. R.B., Philadelphia, Pa.

A. Your box of plant specimens arrived in good condition and made identification quite easy. Your blue spruce tree is infected with Cooley spruce gall aphid (Chemes cooleyi). These galls range in size from ½" to 2½" in length and are found on the terminal shoots of blue spruce and several other species of spruce. They are produced by the feeding and irritation of an aphid. The adult female aphid overwinters on the bark near the twig terminals and her eggs are deposited there in the spring. This pest requires two hosts-one a variety of the spruces that I mentioned and the other the Douglas fir. There must be some Douglas fir trees either growing on your property or in your vicinity. It is best not to plant Douglas firs near spruces. Since you cannot change that situation, you can control this pest by spraying with malathion in the spring just before the new growth starts to emerge on your blue spruce.

classified ads

FOR SALE: Large variety of unusual and rare plants for house or greenhouse. Call TU 4-0497

Exchange Registry — members of associations are being invited to subscribe to our national home exchange directory. Write for brochure: Interchange Connexion, Washington Crossing, PA 18977.

Help Wanted. Gardener with some horticultural experience for large private estate to act as assistant to superintendent. Apply in writing to Box GS, PHS, 325 Walnut Street, Philadelphia 19106.

Advertising copy should be submitted 8 weeks before issue date: November, January, March, May, July, September. Minimum rate \$5.50 (covers up to 35 words). Additional words 20¢ each. Less 10% discount for two or more consecutive issues, using same copy. All copy should be accompanied by check made out to PENNSYLVANIA HORTICULTURAL SOCIETY and sent to Patricia M. Cain, THE GREEN SCENE, 325 Walnut Street, Philadelphia, PA 19106.

HOUSE PLANTS I COULDN'T LEAVE BEHIND



by Ernesta Drinker Ballard

Most of my horticultural efforts over the past 15 years have been devoted to container grown plantshouse plants in winter, terrace plants during the outdoor growing season. One year, when my enthusiasm was at its height. I was growing more than 400 plants in my house, not to mention thousands more in my greenhouse.

But the care of house plants is exacting, as any indoor gardener knows. Tropical species require almost continuous care; it is disastrous to neglect them for 48 hours. Reliable plant "sitters" are hard to find if you want to go away. Insect control can be exasperating. No matter how great your enthusiasm, there is a limit to the joys of reproducing a tropical garden during a Philadelphia winter.

Four years ago, I received a second chance, an opportunity to reexamine my gardening priorities. We moved to a new house, and I was faced with the necessity of looking at every plant in my collection and deciding whether to take it with me.

At first I thought of giving up all my indoor plants and turning my attention to alpines and subtropicals, which I could grow in the tiny greenhouse at our new house. I delighted in the prospect of setting the thermostat at 40° and watering no more than twice a week. Ruthlessly I abandoned hundreds of plants. The first to go were herbaceous standbys-begonias, gesneriads, geraniums, and foliage plants. I knew that if I changed my mind I could easily buy replacements, grow them from seed or take cuttings from the plants I gave to my friends. The next sacrificial victims were a collection of desert plants that I had built up over a ten-year period. Then followed a dozen or more miniature orchids and bromeliads which, through the years, had given me much pleasure.

At this point I suddenly realized that there were some plants I could not part with. At the same time I became aware that house plants were an essential part of our life, as rewarding as our pets, as decorative as our pictures and furniture, as important as our books. I saw that the thing to do was not to dispose of all of them, but to choose the best to take with us.

Then came the actual choosing. I agonized over every choice, most carefully weighing its advantages and drawbacks. You might expect the result of such a process to be a hodgepodge. In fact, however, the plants I finally picked to make the move have many characteristics in common. All have beautiful foliage. Most are large. and mature. Some are woody plants, but in almost every case, the plant has taken a long time to reach its present size. None of them is grown for its flowers. My experience has taught me that most flowering plants need a combination of sun, low temperature and humidity that is hard to provide without a greenhouse, a conservatory or an old-fashioned sunporch (which I had for 15 years).

My final selection has proved to be good. The time I spend on my indoor plants is much reduced. The plants I have, while still requiring daily care, are not difficult to grow nor are they particularly susceptible to insects. Their beauty depends largely on grooming and pruning, which I do when I can find the time. All are grown in handsome containers collected over a number of years. I make it a point to choose a container that compliments the plant.

The illustrations show some of my indispensable plants in their new surroundings. The following notes are an attempt to explain how I grow them and why I could not leave them behind.

Ernesta D. Ballard, director of the Pennsylvania Horticultural Society, has written widely on the subject of house plants. In addition to innumerable articles, she authored two books: Garden in Your House and The Art of Training Plants (Harper, 1962).



Above, left to right: Ligularia tussilaginea aureo-maculata, Lygodium scandens (against door frame), Sansevieria trifasciata laurentii, Chamaedorea seifrizii. Below is a close-up of the Sansevieria trifasciata laurentii.



More About House Plants

Abraham, George. *The Green Thumb Book of Indoor Gardening*. Prentice-Hall, New Jersey, 1971. 304pp.

Ballard, Ernesta D. *Garden in Your House*. Harper and Row, New York, 1971. 258pp.

Cruso, Thalassa. Making Things Grow.
Alfred A. Knopf, New York, 1969. 257pp.

plant descriptions

Ligularia tussilaginea aureo-maculata, leopard plant. The common name of this attractive herbaceous plant from southern Japan derives from the yellow spots on the large round leaves. It is stemless and wilts easily when in active growth in early spring. Fortunately, it revives quickly when watered. The plant pictured is six years old.

Lygodium scandens, climbing fern. This is a beautiful and very satisfactory plant. It has been in my collection for many years. Twice, during the last ten, I have divided the clump and changed the pot. I have also changed the support a number of times. This is easy to do because, once each year, I cut the fronds back to the ground. This operation can be done whenever you see croziers (the name for new uncurling fronds) at the base. I can generally find a few at any time of year, but they tend to be more numerous in the late winter or early spring.

I have collected spores and grown many new plants from them and have increased my collection by division as well. The plant is not always readily available from commercial sources, but it is worth looking for.

Sansevieria trifasciata laurentii, snake plant. The secret of effective gardening is to choose plants that do well in the given situation. A common plant in good condition is far more satisfying than a rare exotic that is only half-alive. Sansevieria is one plant that can withstand abuse, neglect and dry air and still look vigorous. Its leaves are held firmly erect by woody fibers; they never wilt. The color is a rich dark green, lustrous when wiped with a cloth dampened with water, or, better yet, a little low-fat milk. And no hardship will prevent it from putting forth its spikes of deliciously

continued



Above, left to right: Adiantum cuneatum, Podocarpus macrophylla maki (tall plant in dark container against door), Adiantum cuneatum, Asplenium nidus, Nephrolepis verona. Hanging plant: Rhipsalis cassutha. Below, a close-up of the Philodendron McNeilianum.

fragrant flowers in the spring. The container is a dark blue bonsai pot, with two large drainage holes. I water the planting when it's dry—about twice a week. The excess drains down onto the marble sill and, if I have time, I wipe it up.

The fern at the base of the sansevieria is *Polypodium vaccinifolium*.

Chamaedorea siefrizii. This is a clump forming palm which I bought as a seedling from a mail order supplier in Florida 13 years ago. The pot is Chinese porcelain with a large drainage hole in the bottom. Its shape and

decoration are almost perfectly suited to the plant. The three feet on which the pot stands allow enough room under the bottom for a small plastic saucer to catch the drainings. When the plant gets too big for the room, I will divide it, discard the tallest stems, and repot a reduced clump in the same container.

Adiantum cuneatum, maidenhair fern. This may well be the loveliest of all indoor plants. The two pictured here are actually the offspring of a large plant I brought with me when I moved. The spores on my mature specimens find their way to the soil surface of many of my other indoor plants so that I usually have a supply of small plants on hand.

Once a year I cut away all the fronds. In a few weeks new croziers appear to herald a completely new array of green. Sometimes these croziers become infested with aphids, which pose quite a problem, since insecticides that are lethal to aphids generally kill the croziers and fronds as well. The best cure is a forceful stream of water. If the infestation is very persistent, use malathion and plan to cut away all green growth as it dies. New croziers will appear.

The Latin name means "unwettable," referring to the fact that water flows off the fronds without appearing to wet them.

Podocarpus macrophylla maki. Podocarpus is a tropical conifer. Because it grows readily from seed, it is produced by the thousands for dish gardens and terrariums. It is remarkably house hardy. My plant is 25 or 30 years old. It is carefully pruned each spring to retain its columnar shape and present





Left to right: Nephrolepis verona, Davallia griffithiana (low fern), Philodendron McNeilianum (rear), Ficus lyrata (foreground), Aspidistra elatior.

size. In November and December, the oldest leaves turn yellow or brown and drop off. New growth appears in March and April.

Asplenium nidus, birds nest fern. This plant is distinguished by its chartreuse fronds with a sharp black rachis (midrib), which spring from a central tufted root and grow up to 3' long and 6" wide. The common name is derived from their basket shape and epiphytic* habit, which makes them resemble a huge bird's nest in the trees of the South Sea Islands. I find the contrast-

ing combination of a bird's nest and maidenhair fern particularly pleasing.

Nephrolepis verona. I kept three fluffy Boston ferns, two for my sunny hallway and one for a window sill in my bedroom. The principal care I give them is to pick off the dead brown fronds which, if left in place, make them look scruffy and unkempt. In the PHS library, there is an English catalogue, published about 1912, which lists "upwards of 2000" species and varieties of "Stove, Greenhouse, Hardy, Exotic, British and Filmy

Ferns and Selaginellas." An American catalogue of the same period pictures eight varieties of *Nephrolepis*, including one that was awarded medals by six horticultural societies, four other organizations and the St. Louis World's Fair. Today, no more than four or five varieties are available in the trade, and they are sometimes hard to find. This is a pity, for they are excellent house plants. I think they went out of style when central heat came in. They grow best at night temperatures in the low sixties or high fifties.

Rhipsalis cassutha, mistletoe cactus. This is a jungle cactus like Zygocactus (Christmas cactus), Schlumbergera and Epiphyllum. Like other jungle cacti, it is epiphytic, will grow indoors yearround and is neat and interesting looking. The tiny white flowers turn into white berries which account for the common name. Rhipsalis was my first choice as a hanging plant for this very conspicuous place. The maidenhair fern is a volunteer. It really should be weeded out.

Davallia griffithiana. The creeping grey rhizomes of this slow-growing fern resemble the fuzzy paws of a small animal. The plant pictured is growing on a piece of weathered cedar collected as driftwood in the Adirondacks. The planting hole was prepared by hollowing out a cavity two inches in diameter in the center of the stump, drilling a one-inch hole for drainage through the bottom, and applying a coat of a colorless wood preservative with a zinc naphthanate base inside and out. The planting medium was osmunda fibereminently suitable for tropical epiphytes, which this plant is. Now, after 12 years, the wood is beginning to rot at the bottom, but the plant still thrives.

Philodendron McNeilianum. Philodendron means tree-loving, an apt description of the vining types that climb the tree trunks in their native rain forests, reaching for the light that filters through the foliage above. The characteristic aerial roots attach the vine to the trees and absorb moisture and nutrients from the humid jungle air. The self-heading species, of which this is one, have abandoned the vining habit. Their stems grow no more than half an inch a year, which makes them far more practical for pot growing. They persist in developing aerial roots, but since these cannot get moisture continued

*epiphyte—a plant growing on another plant or stump, but not parasitic.



from the dry air in my house, I cut them off.

The plant pictured is more than 12 years old. Each leaf lasts about two years.

Ficus lyrata. The numerous varieties of small leaved fig trees (or rubber trees, as they are often called) that are commonly available have proved to be remarkably hardy indoors. We see them in stores, offices and hotel lobbies, often growing under poor conditions. Their fast-growing trunks and branches lend themselves well to pruning. Indeed, if they are not pruned each year, they soon become shaggy and shapeless. This plant is about 25 years old. It seldom needs repotting. The container is modern Japanese.

Figs are attractive to sucking insects such as scale, aphids and mealybugs. If they appear, I wait for a day when the outside temperature is about 50°, and then move the plant out the door for a thorough spraying with malathion.

Aspidistra elatior, cast iron plant. It is indestructible. It will grow in poor light. Each leaf lasts two to three years. Highly recommended for those people who can't grow anything.

If the large dark strap leaves are kept clean, and the plant is divided when it gets pot bound, it will be a satisfactory house plant indefinitely. In spring, funny, dark purple flowers will be found, almost completely hidden by the leaves. You would never notice them if you didn't look for them. Curious, but fun. The plant in the picture is two feet across at the base and its leaves span a circle more than three feet in diameter. I have grown it about 10 years.

Schefflera actinophylla. This makes an excellent indoor tree. It is an Australian native and grows and thrives with comparatively little light. As in the case of podocarpus, many are grown from seed by commercial growers for use in dish gardens and terrariums. Consequently, they are readily available in all sizes. Topping the plant in the spring a few inches below the growing tip will control the height and encourage the development of branches. This plant is 15 or 20 years old and has been topped several times. The container is Chinese porcelain.





photos by Lee M. Raden

plants from

One form of gardening that brings immeasurable pleasure to a happy few is growing plants from seed. It has always baffled me that such a mystique has developed in our country about the subject; it's really not that complicated. The general techniques and procedures that I have developed for my use come from extensive reading and experimenting. My comments here are based on my own experience in propagating alpine plants from seed, but they apply equally to many kinds of plants.

First, why go to all the trouble? Because for one thing gardeners like the feeling of exclusivity that comes from growing plants that no one else can grow. Only through seeds can we grow many plants from exotic areas that are unavailable in our local nurseries or plant exchanges. Seeds also allow us to experiment with different microclimates in our garden; we can plant the seedlings on the north, east, or west side of the house, on a white wall with a northern exposure, or next to the house on a dark wall with a southern

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exposure. Seed propagation also permits us to save some plants from extinction so that when pollution is reduced we can again enjoy these plants in full robust health.

Without getting into a complicated scientific treatise on genetics, seed is nature's own perfect way to reproduce plants. We know that each seed is a separate and distinct entity about to develop into a plant full of vigor and sometimes, due to genetics, full of surprises as to height, shape and color as well as other characteristics. Fortunately, however, most seeds breed true, and, therefore, knowing this we can be reasonably sure of getting the exact plant we want.

when and how to sow

So, when do we sow cur seed? I

sow all seed the minute I receive them. However, I never sow any seed directly into the ground until mid-spring. I sow the seed that I receive from May through the next March in a seed pan, anything from small bread pans made from pressed aluminum foil to 4" plastic flower pots. I never use porous containers because the soil must never be allowed to dry completely.

Reams have been written on the subject of soil sterilization. There is no such thing as sterile soil in the wild. An excess of heat of any kind disturbs many of the important chemical and biological balances that exist in soil. Good seed soil mixtures can be kept very simple. Ideally we want a light, porous, well-drained medium. Something that will give the seed the moisture it needs to germinate and that will enable the seedling roots to easily penetrate the rich nutrient base for a fibrous root system. These factors make a vigorous seedling. I have found that most of our soil in the Philadelphia area needs to be lightened with some sort of sand.

continued



Lewisina seedlings, 11/2 years old.

The best sand seems to come from one of our local streams. Any sand that does not have a uniform particle size but that is a heterogeneous mixture of different particle sizes will do. The one sand that is not acceptable is children's playbox sand. I never incorporate peat unless I am sowing the seed of Ericaceae and then never more than one-third peat. I know many of you want some sort of proportion and, while I dread stating it, for a general seed mix, let's use one-third coarse stream sand, one-third good garden soil, and one-third compost. Please note: compost is not peat. Every good gardener should have some place for a compost pile. This broken-down organic material gives the young plants the push they need. If it is unavailable, then go to someone's woods, get permission, and dig some of the beautiful dark stuff on the forest floor and use that for compost.

Now we have our containers and our soil mixture. After the ingredients for

the potting mixture have been combined I often aerate it by throwing it into the air; I never screen it, since screening reduces porosity. I then fill my seed pans to within one-half inch of the top. To this nice fluffy mixture, I now distribute the seed directly on the surface making sure that I have a plan for even seed distribution. I like to roll the seed off the palm of my hand with the forefinger of my other hand. Some of you may be horrified, but I only surface sow. Nature surface sows by drifting the seed onto the soil by wind action. It picks its own crevice or shelter. That is why I cover small seed very lightly with coarse stream sand and larger seed with 1/8" to 1/4" stone chips. I label and immediately top-water, store the pans in a light place out of sunlight, and where rain, snow or sleet will not touch them. From this point through germination, pricking out and subsequent transplanting into the garden, I want to control the watering. You can tell if the plant

needs water by weighing the pots in your hand; the light pots need water. A light moist medium is needed for the seed to germinate. Some seeds germinate in ten days; others take as long as three years. My standard practice is to keep all seed pans for three years. Many seeds have a very hard protective coating, and it can take as long as three years for them to germinate.

germination begins

I won't even try to describe the feeling you get when you first see a pan of two-year old seeds suddenly erupt with minute seedlings on some late March morning. OK, now that they're germinating, what do you do? Many people panic—let's fertilize. That's a bad mistake. If you used my recommended seed soil mixture (coarse sand, garden soil and compost), there is ample nourishment for the seeds to grow until it is time to prick them out. They must now get as much sunlight as possible. With the increased light and subsequent increased root system that full sunlight



Types of seed pans



Seedlings 3 months old.



Seedlings outdoors under high shade.

induces, you should substantially step up your watering schedule. Never let the seed pan get sopping wet-only moist. After germination, be careful to prevent damping-off (a disease caused by a fungus). Many chemical compounds are sold to control damp-off and while I'm not against chemicals, I have found that nothing works like moving air to stop damping-off. I move the seed pans not only to more light with increased watering, but I make sure of forced ventilation 24 hours a day so that the seedlings are in constant motion night and day. Most books and many experts state that the best time to prick out small seedlings is as soon as the first set of true leaves develop. I have found this rule erroneous. In my own personal experience, if your watering schedule, light and air circulation are correct, the plants grow to unbelievable size pushing, shoving and clawing their way out of the container. When you have grown them to that point and you transplant, invariably

your losses will be practically nil due to the vigorous root systems that are evident as soon as you shake the seedlings out of their seed pans. It is much easier to work with the tangled roots of a vigorous plant than it is the dainty, weak little plants that only have their first true leaves. It is also a matter of record that many plants need root company and root competition for vigor. Let's face it-any plants that have their growing disrupted by either pricking out or digging have to be protected from the elements for two days to a week. The plants will tell you when they have recovered by enhanced color and uprightness. After transplanting shock is over, I begin to fertilize. I water the plants with exactly one-half of whatever strength is recommended on the package of fertilizer. Having had the full catastrophe too many times with Ericaceae and their fertilization, I feel a little fertilizer goes a long way especially with most soils in the Delaware Valley.

My instructions are simple and I hope I have helped to expel some of the myths that abound with seed. Try it—it will bring new horizons to your gardening pleasure.

sources of seed

Depending on the particular discipline in horticulture that interests you, you can find locally, nationally and internationally plant societies that will give you detailed information on seed sources. Some arboreta have seed lists and make their seeds available. In the Delaware Valley, I've had excellent advice from Longwood Gardens, Swiss Pines, and the Morris Arboretum. There are many commercial sources of seed in the United States and Europe. The lists are all available to you through the Library of the Pennsylvania Horticultural Society and a call will speed the information to you. Finally, collecting seeds in your own garden and saving seed from your own special plants is one of the best sources of fresh, viable seed to share with your friends.



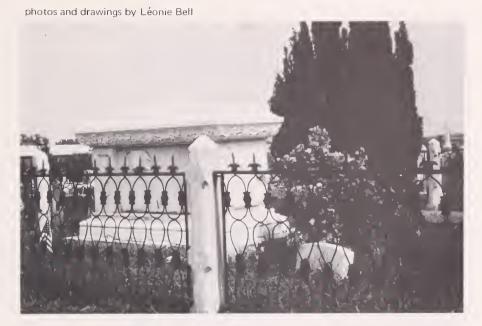
Mrs. Frederick Keays began it all. This remarkable woman who lived in Calvert County, Maryland, scoured her peninsular neighborhood during the 1930's in an unremitting search for old roses. The book about her initial findings, *Old Roses* (Macmillan Co., 1935), became my primer twenty years later in an attempt to learn to distinguish the earliest rose classes.

Another valuable book was published in England the following year-Edward Bunyard's Old Garden Roses (London Country Life, 1936). He listed the garden forms according to their parent species, showing a gravure photograph of each type. His wife devised a charming addition, three pages of drawings of leaves and buds, which became my inspiration for the pencil drawings in The Fragrant Year (M. Barrows and Co., 1967). The Keays and Bunyard books have since been found to contain many errors, but in their era they were the only modern studies of old roses that were truly helpful.

Of necessity, books had to be augmented by the plants themselves, grafted roses bought from specialists. Others, suckers, came from individuals. Over the years the discrepancies in labeling often seemed appalling.

The breakthrough happened in 1968. Until then I had thought that old roses were to be found only around abandoned farmhouses among orange daylilies and lavender lilacs, or in carefully tended pocketbook gardens on the outskirts of towns. That spring, a student at Muhlenberg College, Douglas, reached me through the American Rose Society and invited me to visit an unusual cemetery in Easton. A cemetery! The ones I knew were sterile expanses of granite and grass. "Perpetual Care" never allowed for roses, not even for the white Viola odorata I planted by my mother's grave.

I accepted his invitation with curiosity. He led me to a cemetery full of peace and beauty. Large trees, often rare species, shaded many areas. *Paeonia officinalis*, the old-fashioned "pineys,"



flopped rain-soaked to the ground. Nonsectarian, the monuments were short on statuary but long on variety in a fascinating diversity. A cursory study of dates in the cemetery, opened after the Civil War, revealed what families did with their lost sons, fathers, husbands, then: they brought them back to northern soil. Most depressing were the small stones that gave mute evidence of the high mortality rate of mothers and children in the 19th century.

But this was a *living* place! visited, planted, cared for by many people. Somehow the plastic flowers did not offend, the brilliant Memorial Day geraniums did not clash, set as they were among great mounds of Box and, everywhere, roses. We concentrated on them instead of the headstones.

The roses, I was told, had been cut to the ground the summer before. This seemed an over-drastic measure, but now I regard it as the only sensible way to treat old roses in cemeteries. They are invariably "own-root" (not grafted), sometimes grown from slips over a century ago. Razed to the ground every three or four years, the refuse is burned, spores and egg cases are destroyed. Once-blooming kinds take a

year of cane production before they flower, but the repeating roses start from the ground with buds and give more later.

The sentiment is easy to understand. Georgia Torrey Drennan wrote in 1912 that [dwarf polyanthas] are nature's fairest offerings for the graves of little children. Fragile in construction, fair of face, this lovely trio of roses yet defy extreme conditions of heat and cold, blooming with sweet profusion through the summer and keeping a strong growth of root and branch through the winter months. Green be the sod, warm the sunlight, soft the winds that blow where little children sleep beneath these roses. Constant bloom meant, literally, "In loving memory"-no empty phrase in those harsh vears.

The rose sleuth must bring basic knowledge to the search: the botany of *Rosa;* species possibly used in hybridizing; dates of introduction; the classes as these developed in the 19th century (some no longer used but still valid for the hybrids of the time). Most important, though, is familiarity with what is now in the trade: how each got there; its original source. "Old" roses need continued

OR OLD ROSES IN CEMETERIES



by Léonie Bell

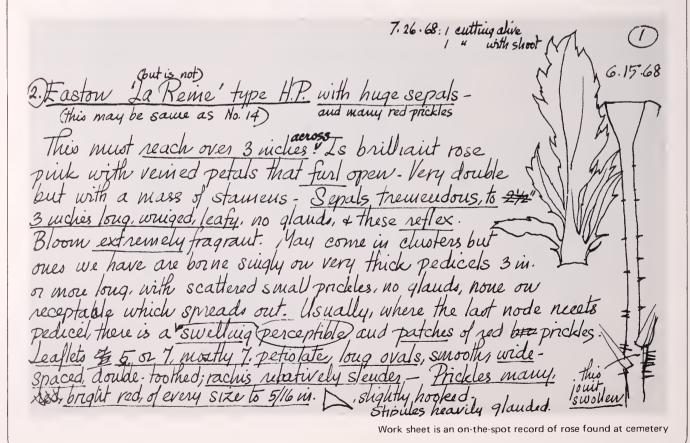
Léonie Bell illustrated John M. Fogg's Weeds of Lawn and Garden and collaborated with H. V. P. Wilson to produce The Fragrant Year. See the September issue of The Green Scene for more complete biographical information on Ms. Bell.







Rose found at tombstone has not yet been identified



not be extremely old; a few are as young as 50 years. They have simply gone out of current style.

Douglas, who already was familiar with many old roses, learned more, even as I learned from him. Last year, a graduate of Philadelphia College of Art, Barbara, joined us. She has since added all of South Jersey to our territory. We follow her route while she follows our lead. Always—we learn.

Some cemeteries are, of course, barren of roses. Others yield perhaps one, but that, a marvelous treasure that suckers around some small area, defiant of the pruning shears, waiting, as it were, to be rescued from oblivion. Often a single sweeping glance is enough for an acre or two. Even if most contain nothing of interest, I keep careful records

Our hope is to preserve and identify, not to pick bouquets of pretty flowers.

of the rose population in each. We name those we recognize. The fascinating strangers are given first the cemetery's name, then their class, later a number. (See illustrated worksheet.)

A population list with its notes is invaluable. By referring to such a list made last year, we knew exactly where to look for particular roses this June: we found some had been cut back but were recuperating, while others, to our horror, had been removed altogether. We collect only what we need, to describe before they deteriorate and then root from cuttings. Should these die, at least we have the word record and the location. Photographs taken under pressure are not adequate for identification. So many small details must be noted that only words, possibly with a sketch of the clue area, have permanent value. Our hope is to preserve and identify, not to pick bouquets of pretty flowers.

Many roses repeated, particularly in the South where Teas withstand winter. We find many examples from South Jersey to Allentown: the distinctive red-stained buds of white 'Frau Karl Druschki'; the two 'Radiances,' red and pink; a tantalizing assortment of pink Hybrid Perpetuals, one of which turned out to be 'Baronne Prevost'; and another, we tease ourselves, perhaps the long-lost 'Duchess of Sutherland' of 1842; the Perpetual Moss 'Salet'; even 'Safrano,' 1839, a Tea whose few petals were tolerated because their color,

pale creamed orange, was unique then and it proved to be a good parent.

'Safrano' is as close to the first yellow China importation, Park's Yellow Tea, 1824, as anything that remains. The first plant we came upon was mostly gray dead wood, 5' high; yet across its crown were numerous buds, unmistakably 'Safrano.' The following year, Barbara and I looked for it in vain. The owners of its plot had

We collect only what we need, to describe before they deteriorate, and then root them from cuttings.

dug it out, roots and all. A similar fate almost happened to a specimen, 15' across, in Virginia; but because the root was left, that plant has begun what is possibly its fifth or sixth life.

A rose that hardly needs illustration is a rambler seen everywhere along country fences. People are apt to call it the Seven Sisters Rose, but, despite its lovely assortment of pinks, it is 'Tausendchön,' child of old 'Crimson Rambler,' brought from Japan to the West in 1893. Compact plants of it puzzled us—until Barbara checked them in August. Emerging from the bushes were new sets of buds, clear proof they were the everblooming dwarf sport of 'Tausendchön,' 'Echo.' Climbing roses were seldom used in cemeteries!

Close to 'Echo' grew other repeating offspring of 'Crimson Rambler': 'Mme. Norbert Levavasseur,' 1903 (Red Baby Rambler); 'Maman Levavasseur,' 1906 (Baby Dorothy); while off along a boundary was the old parent, already mildewed by June. It bestowed to its immediate hybrids not only this weakness, but reddened pedicels sticky with bright red glands.

In Easton, one old repeater, a shock to come upon, was 'Marquise Bocella,' a light pink Perpetual Damask of 1842. This year we found immense specimens in Roxborough and in the garden at Wyck, Germantown, where it had been called Crown Rose because of its pouffed center. Both plants had basal canes, dead and alive, 18" through, with that unique foliage. With no care whatever, it blooms even as I write this in late September, a venerable rose of many names that is currently masqueraded as Jacques Cartier.

Another that flowers from early June till frost is Mrs. Keays's little Noisette, Faded Pink Monthly, the name by which it was known in her part of Maryland. We find this primitive form, with its delightful pink buds and shapeless small white bloom with the revealing Noisette scent, everywhere: along streets in Conshohocken, in private gardens, in every rose-rich cemetery we've explored. Faded Pink Monthly is available from one old-rose nursery as Marie Pavic (correct spelling: Marie Pavié).

Roses that flowered only in June, though, were certainly made use of. The small double white with ornate sepals was invariably 'Mme. Plantier,' 1835. Rosa wichuraiana, Memorial Rose, crept along many a stone edging. We found our first Boursault, 'L'Heritierana,' not sold here since the 1850's. And everywhere, even by the bridge abutment of a turnpike cloverleaf, where once must have been a house, a garden, is the rose we call simply the Hybrid China, an early-flowering, vivid lavender-rose platter of ruffled petals that leave behind constellations of starry sepals on almost thornless canes. It is the most common old rose we find. Many call it Shailer's Provence.

Found almost as often is a lovely, very double pink Damask that opens from red, sliced-looking buds. People tend to dub it "the hundred-leaved rose," but it is in no way Rosa centifolia (the misleading binomial for the

"Old" roses need not be extremely old; a few are as young as 50 years. They have simply gone out of . . . style.

true Cabbage Rose) although nurserymen have sold it as that. The unfortunate present name for this wonderfully fragrant beauty is Kazanlik.

In the last century, eastern United States experienced an enthusiasm for roses that can only be called Rosamania. Between 1840 and 1900, nurserymen like Buist, Prince, Ellwanger, Dingee & Conard, imported roses as quickly as they were introduced in Europe. Roses came into fashion and left it as fast as new classes evolved. I am convinced that many of the earlier sorts that disappeared from European gardens long ago, still grow in this country with its vast assortment of climates, unnoticed and unknown. In time, the treasure will reveal itself. No flower is closer to the hearts of people than the rose.



Elisabeth Woodburn

a garden library



by Elisabeth Woodburn Booknoll Farm

Booknoll Farm Hopewell, N.J.

Elisabeth Woodburn is a bookseller who specializes in horticultural books and books about wine. Ms. Woodburn has worked with many libraries and garden writers to help build their collections. She is active in the Antiquarian Booksellers Association of America.

A friend of mine once rescued a charming little book on parlor gardening as it was on its way from the local library to the town dump. The book, published in 1861, was a forerunner of today's books on house plants, and its cultural information is still valid and useful. One of the duties of a library such as ours is the maintenance of written material, no matter how old, that is pertinent to the field of horticulture.

We all have an obligation to learn about the books written throughout the history of horticulture; otherwise, more and more of these "old" books will be tossed out willy-nilly on city dumps. Just as horticulturists express concern over the fact that so many plants are disappearing because their cultivation requires some work or they aren't considered "saleable items" so, too, many books have disappeared because unthinking people associate newness solely with quality. PHS members who use the Library know that the staff recommends both the old and the new.

Elisabeth Woodburn encourages us to build our libraries in a sensible and realistic manner. Gardens and books are perfect companions. Good gardeners are sensitive to the delights and ideas offered by books which in turn enhance their skills and perceptions in a most practical way.

Julie Morris

The reasons for building a library are as varied as the people who build them. Very few people start out with the avowed intent to collect books, so it is interesting to explore some of the ways a library "happens." In my thirty years of bookselling, this "happening" has always interested me because the books a person buys reflect the type of person he is. We may have a decorator choose our furnishings, a landscape architect lay out our grounds, or an architect design our house, but we choose our own mental furnishings, layouts and designs in the process of selecting books. Books tell such a tremendous amount about their owners that I always feel embarrassed to be caught examining bookshelves when I visit someone . . . a bit like reading private letters!

Of all book collectors, I believe gardeners probably have the most genuine interest in their subject. Gardeners buy books to learn from, to lean on, because they are tired of renewing them at the library and finally, inescapably, because they are "hooked" on the endless delight of having all those beautiful, useful works right at hand. "Hooked," I might just as well state it bluntly. There is no known cure for wanting books of one's own; "to have, to hold," and—for Heaven's sake—never to lend!

I am frequently asked what is a "good book" on this or that subject. The answer is "at what stage of gardening are you?" If a novice does not know a petunia from a salpiglossis the book he would find "good" would be a "garden flowers in color" picture book. If a nurseryman wanted a "good book" on annuals because he wished to grow them commercially, the "garden flowers in color" approach would hardly be satisfactory. The story of many a library lies between these two extremes.

Let us say "Mr. Novice" buys some version of "garden flowers in color" because he would like a few bright flowers. Optimistically he goes overboard buying different kinds of seeds. He then discovers he needs more than pictures to grow them, nice as it is to know what they might have looked like. He plunges and buys an "all-about-it" book to answer all questions. If he remains an occasional gardener, there are some good one-volume general works. Such titles as America's Garden Book by the Bush-Browns, The Woman's Home Companion Garden Book by John C. Wister, are informationcrammed examples by Delaware Valley authors. The Complete Book for Gardeners by Rachael Snyder and the new Nature's Guide to Successful Gardening by William Flemer, III, which focuses on the ecological approach to horticulture, are also good. All these can answer hundreds of questions for the amateur. A garden dictionary, with L. H. Bailey's Hortus II, second only to L. H. Bailey's three-volume opus, Standard Cyclopedia of Horticulture. are good supplements. No one has yet come along to fill Mr. Bailey's giant footsteps so no revision of The Cyclopedia has taken place since 1927 although promises of a revised edition have been made for years. Any printing from 1927 on is as good as "the latest printing" and much less expensive. Watch for the difference between those key words, "latest printing" and "latest edition." A "printing" indicates a book was reprinted from the same plates. An "edition," in modern terms, means plates were changed or corrected before reprinting.

The gardener, now, with some research and acquired skills, is ready to try something new. Here begins diversity. A garden pool, trees, fruits, vegetables, propagation, a "Japanese" garden, bonsai, roses, on and on for the literally hundreds of subjects that fall within the category of a garden library. As a dominant interest arises so does the need for more sophisticated knowledge. For a subject like roses, there literally is no encompassing the books about them. There are categories, for example, books about old rose varieties. or books with colored illustrations. A bit of advice about the latter category; it includes one of the most valuable of all horticultural monographs-Redoute's Les Roses published first from 1817 to 1824 in three volumes.

Herbals have been discovered—the death blow for any subject.

Collectors frequently find side interests in horticulture of as great fascination as gardening or planting. One knowledgeable garden writer with a fine, serious library of reference works also has tracked down and collected the largest group of "language-of-flower" titles probably available in this country. Others, who find winter months their only time for reading, enjoy tales of plant-hunting, lives of plantsmen, and pursuits of new avenues of knowledge.

It is difficult to become interested

in horticulture without questioning how it began. Many histories have been written on the subject, from a twovolume work, written in German by Marie-Luise Gothein and translated as A History of Garden Art, to Richardson Wright's lively The Story of Gardening from the Hanging Gardens of Babylon to the Hanging Gardens of New York. For those interested in our English gardening derivations, there is Alicia Amherst's A History of Gardening in England (confusingly issued in the third edition under her married name, Mrs. Evelyn Cecil). A good history puts one's subject into perspective. Few horticultural subjects were missed by the Victorians. The books of the 19th Century, that peaceful era when men and women of talent devoted their lives to the study of plants, are a veritable treasury of horticultural knowledge. The magazines of the time, many exquisitely illustrated, give the sense of excitement generated by new plants, their discovery, growth and blooming. They also describe the various garden styles (if history doesn't repeat, it surely does copy) and give news of newly formed plant societies and people. These horticultural journals in presenting "the news of the time" turn back the hands of time for us.

The number of uncollected and undeveloped possibilities for collecting in the horticultural field is both heartening and stimulating. Heartening because prices stay within reason on books in limited demand. Stimulating because you can be your own historian and bibliographer in the course of tramping your "untrodden ways."

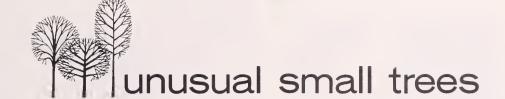
Two well-worn paths should be avoided. Color plate books and early herbals have both become subjects to avoid unless one has an oil well amongst his roses. The ranks of color plate books have been decimated since World War II by the decorating school, which pronounces them as "darling" on lamp shades and rips the books apart. Herbals have been "discovered"—the death blow for any subject. Let a few of these possibilities, however, stimulate your thinking to extend your gardening season to 12 months a year through books. Begin your consideration with your favorite flower, shrub, tree, or vegetable. Violets, perhaps? The literature is small but their inclusion in so many works would enable one to fill a pretty large bookcase. The potato, whose influence changed history; the lilac, its introduction, history and development; horticulturist Andrew Jackson Downing and the people he influenced; the contribution of women to horticulture -specialize in just one of the great ones -Jane Loudon, Gertrude Jekyll, or our own incomparable Louise Beebe Wilder; all of these subjects give room for collecting. Seed catalogues have had little appreciation as a source of the history of plant introduction and development. They also show shifting emphasis in flower popularity displaying the history of the plant by their offerings. Seed catalogues often give bits of nursery history, thereby giving a clue, sometimes the only clue, to the development of horticulture on our expanding frontier. Nurserymen made American horticulture. Almost without exception, every early book on horticulture in this country was written by a nurseryman to tell his patrons how to grow flowers. This practice still gives us some of our best books. Or be a pioneer today, if you prefer, and collect books on growing plants under artificial light. Now, I don't think there has been much written on that.

As the collector delves he learns who has made original observations and who has synthesized. Lest that be interpreted as a sneer, please recall that the greatest contribution Linnaeus made was to synthesize the work of many before him who had snatched glimpses of the whole, here and there. His great ability was relating facts to one another. In building our library we, too, can relate facts to one another and develop a larger picture of our world.

There's no cure for wanting books of one's own; "to have, to hold," and—for Heaven's sake—never to lend!

The real value of collecting, of course, is in the stimulation to one's ideas and in the fun of fitting in pieces missing over the years. Visits to libraries tell us what we want; visits to booksellers tell us what we can find and afford. It is nice to be able to point out to our friends and relatives (who always feel there must be a "reason" for collecting) that whatever the book costs, its value is enhanced by being part of a special collection. It is good to find that when you wish to dispose of your carefully gathered collection others put a monetary value on the time you felt "well spent." But that is just talk, of course. Only a bookseller is stupid enough to sell a book.





Two factors should primarily be considered when organizing and planting today's home garden: yearround beauty and interest and easy maintenance. Certain conifers and broad-leaved evergreens should provide the background of such an enterprise. Seasonal color may be achieved by combining woody and herbaceous material. One focus, however, is far too often neglected: the form and bark of deciduous trees, which contribute so notably to the charm of our most colorless season, winter. Though we may not achieve the flamboyant riot of color easily achieved during other seasons, with a little study and careful selection, the garden during winter months could be filled with interest and a simple beauty. Such efforts should be concentrated in areas where one naturally passes in going to and from the house and areas seen from windows.

Numerous small trees offer fascinating winter forms. Perhaps one of the most interesting is Zanthoxylum simulans or prickly ash. A native of northern and central China, this spreading tree of 20' to 25' in height, best displays its dark branches covered with stout prickles, when silhouetted against the snow. As the tree matures, the bark seems almost horny. The a dainty appearance. In the fall the beauty of this handsome specimen is enhanced by clusters of numerous, small apricot colored fruit that open to expose shiny black seeds. The prickly ash should be planted as a specimen where its perfect vase-like form may be appreciated, or in a shrub border with very low shrubs, where it may rise up from the ranks, so to speak.

Poncirus trifoliata is another armed tree covered with stout spines from China. Left to its own devices, this tree will develop into a tangled mass of undisciplined branches. However, pruned, it becomes one of our most spectacular and useful ornamentals. It makes a handsome espalier, particularly against a plain surface, where its

fresh, bright green branches may be notably displayed. When trained as a standard, it acquires great style. It should not only be pruned into shape, but the oval part of the standard kept thinned, so each branch achieves individuality. If these standards are placed so they are viewed against an evergreen background, the results will be unsurpassable twelve months of the year. At the end of April they are covered with small white flowers resembling an orange blossom. During the summer months, the chartreuse-colored fruit gets larger and larger and in September when it has reached a diameter of about two inches, it turns bright yellow. The fruit remains yellow long after its trifoliate leaves assume the same color.

In contrast to the tangled masses of branches of the poncirus is the naturally disciplined form of Stewartia. Commonly known as the false camellia because its June blooming white blossom strongly resembles the flower of the camellia, its colorful exfoliating bark lends a special beauty to the winter scene. This tree should be used only as a lawn specimen in a prime location, for nothing should be allowed to detract from its unique beauty. The bark of Stewartia sinensis and Stewartia monadelpha is light brown, exposing a beige undersurface as it peels off, creating a mottled effect. Stewartia pseudo-camellia has red bark and a more upright habit than the other two varieties mentioned. In the fall the leaves are a bright purplish color.

We should also consider several species that are upright or columnar in form. Such a horizontal form is often needed as an accent in the garden or on the corner of a building. Xanthoceras sorbifolium is one of the very few members of the Sapindaceae or soapberry family that is hardy in this area. A native of China, the name comes from the Greek words Xanthos, yellow, and Keras, horn, alluding to a horn-like structure which is part of the flower. This tree will not attain a height of more than 20'; its branches

lustrous compound leaves give the tree

garden. Poncirus trifoliata. The young fruit in August is the same color as its fresh green, thorny branches and leaves. By October, the trifoliate leaves, as well as the fruit, have

by Mary B. Hopkins

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scape Design at the Ambler Campus, Temple

Further study in the Department of Land-

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culture. Currently, she teaches Woody Plant

Material at the Barnes Foundation and does

private consultation work in garden design. An ardent gardener herself, she has studied

and observed woody plants and perennials

for many years to ascertain their contri-

bution to the year-round beauty of the

two great interests, teaching and horti-

turned a spectacular vellow. photos by John E. Hopkins

continued

jan. 1973

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green scene

the

Acer tegmentosum - attractive striped bark, green and white in color.



Stewartia pseudo-camellia - creamy white blossom blooming in June, appearing very much like the true camellia.



Stewartia pseudo-camellia - mottled beige and gray bark, with interesting branching near the base of the tree.

remain in a tightly compressed upright form so that its diameter does not exceed 18". The dark green leaves are compound and sharply serrated and to add to its charm, in May it bursts into a profusion of bloom, its white pealike flowers borne in small racemes. Each flower has a blotch of yellow at the base, which changes to red as the flower comes into full maturity.

More open and angular, forming a very strong winter silhouette, comprised of almost black branches, is Zizyphus jujuba. The branchlets are often fascicled and bear an edible, dark red fruit which eventually turns black. The tree grows 25' to 30' and perhaps 3' in diameter and is particularly valuable because it withstands heat and draught. It prefers and alkaline soil, so would not be good in a border of ericaceous material.

A third upright form, offers still another completely different silhouette, for other than several major leading upright branches, Carpinus betulus 'Fastigiata' is comprised of numerous, wispy almost impenetrable branchlets. Its overall winter appearance is that of a delicate, refined column. Older trees have been known to achieve a height of 50' and a diameter of 30'. Another interesting form of the European hornbeam is Carpinus betulus 'Columnaris.' This tree would be of the same general proportion as the C. betulus 'Fastigiata,' but egg-shaped. Both trees are extraordinarily neat in appearance when in leaf, appearing almost clipped. The size and shape of these hornbeams make them monumental in appearance, a noble achievement for a small deciduous tree!

Winter forms cannot be discussed without including two trees that lend a weird and contorted form to the landscape. They are, of course, Corylus avellana 'Contorta,' the twisted form of the European hazel and Salix matsudana 'Tortuosa,' the corkscrew or contorted willow. Each of these is of interest only because of their unique appearance and should only be used for specimen planting. The smaller of the two, Corylus avellana 'Contorta,' which is about 15' high and 6' to 8' in diameter, has long pendulous staminate catkins, which sway with the gentlest wind, giving the specimen an appearance of constant motion. Salix matsudana 'Tortuosa' is double the

height of the hazel and upright in form. Its numerous slender branches each appear as if irrevocably twisted by a bolt of lightning and stand eerily reaching towards the heavens.

We shouldn't overlook the genus Acer; three of the maples have fascinating barks. Acer griseum, the paperbark maple, a tree not exceeding 25' in height, has cinnamon brown bark. which peels off in thin flakes. Acer pensylvanicum, or moosewood, is conspicuous in winter with its green bark striped with white lines. This tree does not have the refinement of Acer griseum, and would best be used at the edge of woods or in a naturalized setting. Acer pensylvanicum erythrocladum has twigs that are brilliant red in winter. Slightly taller and more narrow in form, with green bark even more vividly striped than the moosewood maple is Acer teamentosum. A group of these trees planted in a section of an informal garden would be unusual and charming.

If we were to rate trees for yearround beauty, the Japanese clethra, Clethra barbinervis, should obtain a mark of perfection. It can be grown as a single or multiple trunk. The exfoliating bark sheds its outer layer exposing blotches of lighter tan beneath. The white flowers are borne in long drooping racemes, their profusion filling the air with a fragrant aroma at the end of July, a time when few trees offer color. The small brown subglobose capsules that develop remain on the tree throughout the winter, their pendulous forms accentuating the upright quality of the entire specimen. Even when in leaf, the general structure of the tree is so open, that the spectacular bark is always the most conspicuous feature of the tree. The Japanese clethra could well be used as an accent in a garden bed or shrub border, but should always be placed so that other plant material is subsidiary.

And now as winter comes and nature's hand canopies our gardens with snow, we need no longer retreat from a suddenly silent scene. For frost, by the very act of denuding our garden forms, has suddenly exposed beauty, before hidden to our human eyes: fantastic forms, seasoned pods, barks designed by an artist's palette. Nature in its simplest form is perhaps the most beautiful of all.





I don't like weeds. They serve a purpose, I suppose, by recycling soil nutrients and controlling erosion in uncultivated places. But in a garden they mean work—and I don't like work either. On the other hand, I do like vegetables, but until I discovered plastic mulch, I hadn't been able to grow them without weeds and the attendant season-long work.

Black plastic, one and one-half thousandths of an inch thick, is an amazing garden material. It's tough—you can walk on it without making holes of consequence. It's warm—sunlight can heat it to 116°F, or more. It's opaque—weeds, even perennials, die because they cannot get any light. It's water-proof—soil moisture is brought to the surface where it is available to shallow-rooted plants. It's cheap—a 1,000' roll, 4' wide, costs about \$15.00, or about 0.375¢ per square foot.

The techniques of using plastic mulch are still being developed, so there

ESSAY AGAINST WORK AND WEEDS



is plenty of room for individual experiments and, as with all experimental efforts, there will be some successes and some failures. Here are some of the problems and successes that I have had with plastic mulch.

Strawberries, particularly everbearing strawberries, respond well to plastic. It reduces rot because the berries are kept dry. Weeding is nearly eliminated and runner plants can be spaced to prevent overcrowding by making holes for only those you want to root. As an added benefit, plastic reduces summer slug damage, probably because the temperatures under the plastic are too high for their comfort.

Large-seeded crops, such as beans (lima and string), squash, cucumbers, melons, and peas, can be planted directly through plastic sheets. I make an X with a broad-bladed asparagus knife and plant shallowly in the center of the X.

John Gyer is a chemical engineer in product research at Mobil Research & Development Co. Gyer brings his experimental skills to his gardening. With his wife Janet, he has turned an eroded New Jersey sandhill filled with sandburs into a fertile and productive garden. The Gyers favor organic gardening.

Plastic mulch reduces weeds

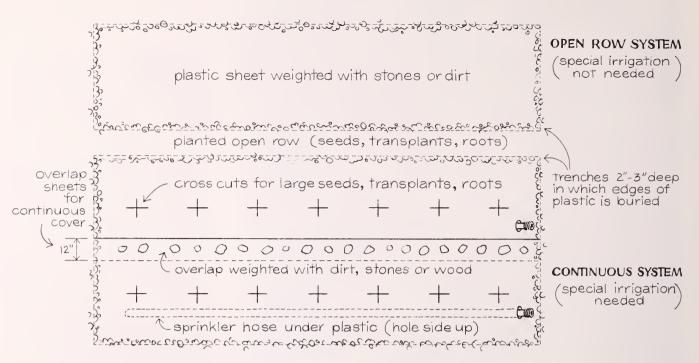


Diagram 1: Plastic laid in an open row and continuous cover system

Roots, bulbs and tubers can be treated in the same way as large seeds or planted in open rows between walkways of plastic (Diagram 1). I prefer planting through plastic, for there is less weeding. Asparagus planted shallowly beneath the plastic grows well, and I have had particularly good luck with onions.

Transplants, such as tomato, pepper and cabbage, can easily be set through holes made in the plastic after it is laid, or set out in the open-row system (Diagram 1).

Small-seeded crops, such as spinach, lettuce, radish, carrots, beets, and chard, are a distinct problem. They can't be planted seed by seed, for it would take too long; and I have learned that the plastic must not touch or cover the sprouting seeds because when the sun heats the plastic the young plants will parboil. In my first attempt at growing small-seeded crops through plastic, slits were made by jabbing an asparagus knife rapidly up and down through the plastic as I drew it along the row. This gave a depressed row in the soft soil and a series of closely spaced holes in the plastic. Broadcast seed was worked through these holes just into the soil surface. The seeds sprouted but the heat killed most of them quickly. However, some rows were more open-the asparagus knife had made a continuous slit and the plastic had pulled back away from the

row of seed. These rows did well. In subsequent plantings I made the slit continuous and pulled the plastic back to make an opening about an inch wide, (Diagram 2). I sowed the seed in a shallow row, covered it, and firmed the



photo by author

soil. The rows planted in this way were short, about 2' to 3', but they can be closely spaced, about 6" to 8". To keep the plastic sheet from billowing in the wind, I put a block of firewood, or another weight, at the end of the short rows, and then alternated the slits in the next series of rows. If the between-the-row plastic begins to move too much, I weight it down with a little dirt.

This technique has worked well on a very well-drained, fast-drying, sand-based soil. On a heavy clay soil, where water is held longer, plastic strips can be laid on either side of a foot-wide open soil row. Small seeds are sown in a double row in the open area. Weeds are not as well controlled here, but excess soil moisture can evaporate and rain can get to the plants more easily.

watering

Since plastic is waterproof, it keeps soil moisture in and rainwater out. The strip method and the short close row system allow normal watering procedures, but if a large area is completely covered, some irrigation must be provided. A perforated sprinkler hose does a good job. I lay it under the center of each 4' strip of plastic. Twenty-five foot hose lengths provide a good rate of water application at normal household pressure. Fifty-foot lengths are satisfactory, but will not water well near the end. Longer hoses should be avoided. I lay the hose hole side up. The plastic sheet acts against the perforations as a valve and reduces flow. Watering takes longer this way, but channels are not washed into the loose soil, and water is more evenly distributed than when the hose perforations point down. With this system, and a faucet type syphon, soluble fertilizers can be applied during irrigation. A caution, however: because of reduced evaporation, the plastic garden should

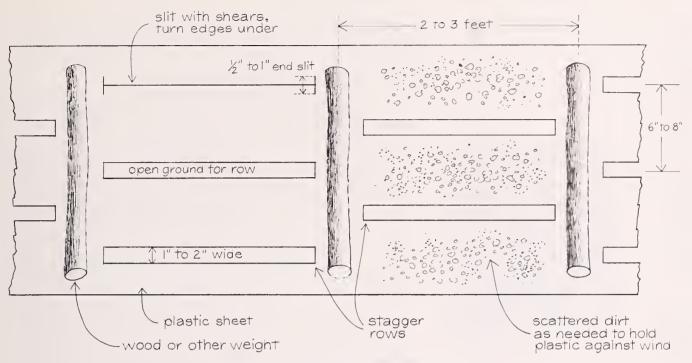


Diagram 2: A row system for small seeded crops

not be watered too heavily. This is a particularly strong caution on clay or heavy soils.

laying the plastic (Diagram 2)

Diagram 2 illustrates the laying techniques that I have found convenient. I make a small trench (2" to 3") at the end of the strip and along one side (both sides if planting is done between plastic strips). I lay the end of the roll in the end trench and cover it with dirt. I lay out the sprinkler hose and roll the plastic sheet over it. One side of the sheet is buried about 2" to 3" in the trench and covered with dirt. The other is left open if I am going to overlap sheets, or buried if I want an openrow system. Overlapping sheets are just rolled out and lapped about 6" to 12". The laps are weighted with stone, dirt or wood. The overlapping technique can cover a large area with a plastic roof. However, a hose is needed at least every 6' under overlapped mulch. As a final touch, I put enough weight, dirt, stones, wood, or whatever is available on top of the plastic to keep it from billowing in the wind. On large areas, I make holes in the sheet where rain puddles collect to allow water to enter the soil and keep it from forming mosquito breeding places. The weed problem associated with these small holes is minor.

durability

Well-laid and weighted plastic can

last several years. Some of mine, on a clay soil, has been left in place for four years, and will be useful for at least two more. Sharp objects, hoes, rakes, shoes, animal claws, sticks, and stones in the soil can all make holes. Small holes are no real problem, but large tears mean the entire sheet must be replaced. From my experience, an average setting should be good for about two years.

Summer vacations need not result in a lush weed growth in the garden when plastic is used. Early crops such as peas and spinach are usually finished by the end of June. If these are grown in the open-row system, harvest them and roll another sheet of plastic over the row. Weeds won't grow, and when vacation is over the soil is in good condition for fall planted crops.

soil preparation

Because plastic can be used as a permanent mulch, I prepare a rich soil before the plastic is laid. Most minerals can be supplied in the irrigation water, but the organic component of the soil cannot. Since the organic fraction will disappear with time, I mix into the soil a lot of compost, leaf mold, or aged manure. This is rototilled as deeply as possible, along with a liberal application of lime, phosphate and trace elements. The results from this soil preparation and mulching have been generally satisfying, and at times spectacular. In fact,

the plastic mulch results are so good that it has become a valuable commercial procedure. In tests at the University of Kentucky, plastic mulched string beans outyielded cultivated beans by 200 bushels per acre, and the quality was better. In New York, yields of head lettuce from plastic mulched areas were nearly three times those from cultivated fields, and there was less bacterial rot. In New Jersey, fields of cantaloupe planted through plastic mulch are nearly weed-free, vigorous, and yield double the crop of unmulched fields.

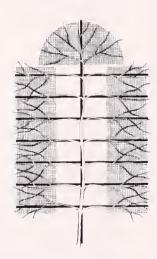
Because of the large areas covered, plastic is laid for commercial crops with a simple mechanical device, which an ingenious do-it-yourselfer could adapt to a garden tractor. Shallow trenches at the sides of the plastic strip are made with plow-like cultivator tines. As the tractor moves, plastic unrolls from a rod which holds it centered between these trenches. Its edges are forced into the trenches by idler wheels while another cultivator tine throws dirt up against them. In a large garden, a simple device like this can save a great deal of time

As you can see, there are many variations on the plastic mulching theme. In your own garden you will undoubtedly have to develop some variations of your own. Experiment with them, and enjoy the fruits (and vegetables) of your labors.



Lois Woodward Paul is supervisor of education at Longwood Gardens, She was given the PHS Distinguished Achievement Award in 1964-65 for, among other things, "her own good taste and high standards in teaching and practicing the art of horticulture."

photo by Gottlieb Hampfler



At her small North Hills greenhouse, Dorothy P. Keith experiments with new kinds of plants every year, heavily favoring begonias, gesneriads and topiaries. She won the PHS Horticultural Sweepstakes trophy at the 1972 Philadelphia Flower & Garden Show.

see back cover for photo

vinca rosea 'alba pura'

The pure white annual Vinca rosea 'Alba Pura' has been nothing but a joy in our garden at home. Each year there seems to be another use for this versatile plant. When we began to establish a ground cover of periwinkle, 'Bowles' variety, the annual was interplanted in an interesting fashion adding bloom and grace until the beds became established.

Currently we have enjoyed the white vinca planted in large terra cotta pots in combination with single blue petunia 'Sky Magic,' the floriferous double petunia 'Peach Tart,' plus verbena 'Amethyst' and 'Delight,' a coral pink.

Longwood Gardens has displayed the white vinca plant for many years in the conservatory, in the part of the flower border that gets some shade, and in the sunny square garden.

The photograph shows the shiny dark green leaves in contrast to the pure white flowers. It usually grows 15" to 20" tall but can easily be pinched to a lower size if needed. When cut for indoor use the foliage adds a luster and as one flower fades another opens.

Liberty Hyde Bailey gives the common name Madagascar Periwinkle adding that it is probably not native to the Old World but cosmopolitan in the tropics. It belongs to the Apocynaceae or dogbane family which includes other beautiful plants such as plumeria, allamanda, and carissa.

Perhaps one reason that this particular vinca isn't grown more widely is that it is propagated from seed sown not later than February 1 to have sizeable plants for the garden as soon as danger of frost is gone. Longwood Gardens uses a greenhouse. At home a hotbed and later a cold frame can produce very satisfactory results. Germination, which takes two to three weeks, requires a soil temperature of 65°-75°F. When the seedlings are large enough to handle they can be transplanted to flats, then on to 2" and 3" pots. They are slow to start growing and will quickly yellow and die if grown under cold or wet conditions.

It is often possible to buy young plants in the spring.

The care in the garden is minimal, succeeding even under hot dry conditions and "even in areas of high pollution," adds Ball's Red Book.

Listed in many seed catalogues are other cultivars which may fit into a special color scheme: 'Little Bright Eye,' white flower with red eye; 'Little 'Pinkie,' a rosy-pink. V. rosea 'Rose Carpet' is a new procumbent type that can be used as a trailing plant in boxes or baskets. The pink in this group could be improved, hence the preference for the pure white form.

To date there have been no pests or diseases, and the plants will bloom continuously until frost if given fair exposure to the sun. What more could one ask of a flowering plant?

Lois Woodward Paul

eugenia uniflora

Surinam cherry (Eugenia uniflora), a slow growing evergreen is a delightful house plant not seen often enough. Its glossy green leaves are complimented by new bronzy growth in spring. During the summer the flowers are far from conspicuous but are a delight in their delicacy, borne in clusters of 1/8" puffs of white stamens. A later change rewards you with small black fruits, supposedly edible; however, I've never let my fruit develop. Eugenia lends itself to espalier or topiary work with its quick response to pruning. My existing plant is approximately eight years old, espaliered on a tee-shape form of seven tiers using the opposite branches bared about 5". Vertically at the form's end runs an 8" wide length of hardware cloth attached to the form to which the branches are spread and tied flat, the foliage covering the wire. Above the form is a clipped halfmoon, or semicircle, about 12" high, 23" wide, originally trained on wire but now on its own. Clipping and pinching are done as new growth starts in spring. Each year it is necessary to release all ties to avoid strangulation and to add an inch to the form's base, raising it even with the lateral branches to compensate for new growth, and I usually repot at this time in porous one part sifted soil, one part compost. The plant needs copious watering in summer, moderate in winter, and enjoys syringing at all seasons to maintain its glossy foliage. The plant summers on the terrace

against a white clapboard wall and winters against a greenhouse bench facing south. This particular eugenia was house grown for several years before it was espaliered.

Dorothy P. Keith

gaylussacia brachycera

The choice of evergreen ground covers for the Philadelphia area is not large. Box huckleberry (*Gaylussacia brachycera*) is an admirable, often overlooked candidate for such use.

Stands of the low evergreen are found in Pennsylvania, Delaware, Virginia and West Virginia in open woodlands on humusy, moderately acid soils. Occasionally it is the dominant plant on ridge-top balds. One such stand in Juniata County, Pennsylvania, covered more than a mile at one time, but it has since been reduced by fire and road building.

The plant spreads by underground layering, sending up closely spaced stems $8-12^{\prime\prime}$ tall. Leaves are densely placed, averaging about $\frac{3}{4}^{\prime\prime}$ long. Flowering comes on the branch tips in June; however, not all bear blooms. Like other members of the heath family, the blossoms are urn-shaped, but borne erect, almost sessile. The $\frac{3}{4}^{\prime\prime}$ flowers seem carved from wax, pink suffused at the tips. Blueberries ripen in September. Only stands of mixed clones make fertile seed.

Throughout the growing season foliage is attractive, glossy and rich, dark green. As wintergreen leaves color in the cold months, box huckleberry turns to wine in well-lit exposures, or purple flushed in shade.

Seed propagation is from outdoor winter sowings in sand and brown peat. Alternately, the natural layers may be removed (best just after flowering) and rerooted in a close atmosphere in equal parts of sand, brown peat and soil.

All evergreens suffer in extended drought, but box huckleberry withstood the severe summers of '66 and '67 with only minimal foliage drop. If soil is excessively poor, a top dressing of cottonseed meal or other organic acid-reacting fertilizer in early spring is helpful.

Few neighborhood garden centers know of box huckleberry. The specialty growers do propagate it. (Call PHS for sources, WA 2-4801.)

Oliver Stark

forcing primula polyantha

Nothing is more exciting than a bright splash of color in the greenhouse during February and March. It's so easy and so worth the little effort involved. Purchase in time for July sowing stratified seed of *Primula polyantha*. If not stratified, you should place seed in a tight-fitting container and leave in the freezer for 10 weeks. Mix and sift well one part good garden loam, one part leaf mold, one part coarse sand. Cover the bottom of a shallow pan with small pebbles, add soil mix to within ½" of rim, scatter seed and sprinkle milled sphagnum moss over the top. Place seed pan in a saucer of water and let it soak up to the rim. Cover pan with newspapers and place on the greenhouse bench (shade covers the greenhouse during the summer). Do not let the seeds dry out. When germination begins remove paper and transplant when true leaves appear. Shade for several days and then up to good light but not direct sun.

By September 15th the seedlings are well established and the shading should be removed from the greenhouse. Feed weekly with Peters Special 20-20-20. Keep repotting ending up with a 4" pot.

There's joy in watching the lovely foliage develop and the sudden appearance of buds is enough to cheer and delight anyone.

The days are growing longer and so are the primroses and then one morning in February something is blooming in the greenhouse!

These may be planted out in spring, but remember any forced plant will take at least a year to recover.

I've had success with this method for several years, but we all know conditions can vary for the individual grower. No matter which method you use, the P. polyantha is an exciting addition to any cool greenhouse (45-50°F).



Oliver Stark is park botanist at Washington Crossing State Park. For many years he was nursery manager for the Pearce Seed Co., which was located at Moorestown, N.J. It was there that he developed a strong interest in herbaceous perennials, which he continues to grow at his home in Newtown Square.

drawing courtesy Bowman's Hill State Wild Flower Preserve



Sarah M. Reath is an inveterate winner of awards in the horticultural section of the Flower & Garden Show. Last year she won several firsts for her handsome animal topiaries, container-grown plants and rock garden plants.

drawing by Doretta Klaber















HORTICULTURE IN THE DELAWARE VALLEY

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Members of the County Line Nursery crew

cover the moist root ball of a white birch with burlap before it is moved to the green-

house for forcing. Story on page 2.

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the warp and the woof

If plants are the warp of the fabric of horticulture, people are the woof. Without people you can't grow trees or shrubs, or plant them, or fertilize them, or prune them. It takes skilled people to prepare the seed bed for a lawn, to plant the seed, to nurse it through its infancy and to keep it healthy after it has reached maturity. And, of course, a person needs not only training but experience to decide what plants will grow well and produce the desired effect in a particular spot in your garden or your neighbor's front yard.

We all know the importance of people in horticulture. We are all quick to acknowledge that a friend's garden is a delight; it is so because of the thought and the long hours our friend devotes to it. But somehow, when we move beyond the devoted amateur into the world of the professional horticulturist, we forget these fundamentals. We ask for horticultural results, but we don't provide the people who can produce them.

Examples are easy to find—parks with rows of newly planted trees, dying from lack of care; city squares with ornamental plantings choked with weeds and beer cans; ground beds in urban developments with nothing in them but clay and rubble; street trees in need of pruning and fertilizing. Over and over again we see the results of an ambitious plan with an inadequate budget for maintenance.

In the private sector the situation is not so very different. We at the PHS are all too familiar with the homeowner who needs professional assistance but is unwilling to pay what it's worth. The same person who routinely pays a plumber or an electrician \$6.00 an hour is often unwilling to pay half as much to a horticulturist.

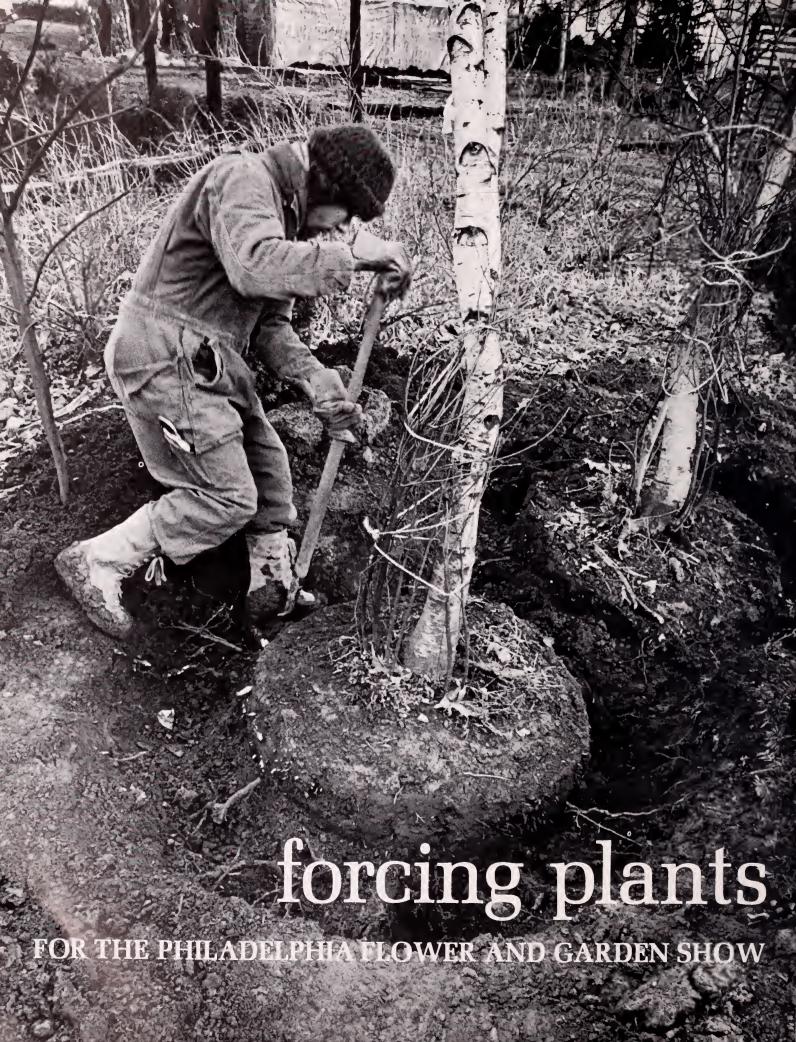
The result has been a vicious circle. Because horticultural jobs were few and poorly paid, few people applied for horticultural training. Because there were few applicants, there were too few schools. Because there were few schools, there was a shortage of trained people to fill the jobs that did open up.

Now the picture is changing. The renewed interest in green plants among environmentalists is generating more interest in horticulture. The schools are expanding. But still there are imbalances in the system, and it is still true that professional horticulturists are poorly paid.

One of the objectives of the PHS is to do something about the problem. Through our *Room to Grow* film and our careers in horticulture programs, we are encouraging young people to enter the field. At the other end of the chain, we are constantly urging civic agencies to spend the money necessary to take care of their plantings. And every year we give awards to businesses and agencies that achieve outstanding results.

We ask our members to do their part in this effort. The next time your neighbor complains about the appearance of her lawn or her shrubbery, suggest a professional landscaper, and don't let your neighbor grumble about the cost. We need a much larger corps of well-trained, well paid horticultural workers. The best way to get them is for all of us to spread the word that a good horticulturist can do wonders to enhance the appearance and prolong the life of our trees, shrubs, lawns and herbaceous plants, and that, like any other labor, he is worthy of his hire.

Ernesta D. Ballard



by Bradshaw Snipes

Bradshaw Snipes's nursery is in Morrisville, Pa. It's the oldest nursery on the eastern seaboard, begun by his ancestors in 1767. Snipes also operates a golf farm and a farm with orchards and strawberry crops.

A white birch tree to be forced for the Show in March is dug in December.

photos by Edmund B. Gilchrist, Jr.

I've been a nurseryman for 20 years and growing unusual plants and creating soft, restful landscapes interests me greatly. While the Philadelphia Flower & Garden Show is considered Mecca by many fine horticulturists and stimulates them to exhibit there, for some reason I found myself holding back from entering an exhibit for several years.

Truthfully, the thought of creating a garden and forcing plants for the Show frightened me and I put it off as long as possible. Then one day pride, self-assurance, a realization that I could do it as well as so and so, plus the urge to create an idea with nature's plants took hold of me. It was time to act! And to act before the gremlins of hesitancy, fear and good sense set in. I applied to enter an exhibit in the 1968 Show. Getting over the mental hurdles opened the gate to accomplishment. The biggest problem was behind me; I must confess, however, that each year I still run scared.

When creating a garden exhibit, design and the choice of plants are basic considerations. Some people first have a great design in mind, and plant material just falls into place. Conversely, a botanist may want to display several terrific plants and then work a design around them. Both considerations are important, and the more they can be harmoniously interplayed the better.

Planning the exhibit begins long before the spring Show. In the late fall plants for the exhibit are gathered. I find it helpful to mark out the boundaries of the proposed exhibit on our lawn with string or lime. We then place the dug plants according to our design on the marked out lawn area. At this stage changes are made as shapes and heights and accent points are interrelated. We make careful notes and begin to modify or expand our design. After this workout, we then mound up mulch around the root balls in some protected place where the plants will remain until forcing time.

choosing plant material

In choosing plant material I think azalea, both evergreen and deciduous varieties, and rhododendron win out because they bloom in many beautiful colors, and they force with some degree of predictability. *Pieris japonica* is another good plant easily forced, and its white flowers create a delicate gracefulness. Various shades of green

help to create demarcations, contrasts and textures as well as a sense of height and depth. Yews, hemlock, hollies, pines, junipers, and some varieties of cotoneaster are used for these purposes. Flowering bulbs provide fascinating color and some fragrance, but remember to have sufficient back-up pots of bulbs to replace those beginning to droop halfway through the eight-day Show. Most varieties of shade trees are too large to use. Generally flowering trees, which usually mature in smaller sizes than do most shade trees, are more useful for height and color. We all have our favorite flowering trees and some hold their blooms better than others. Dogwood, hawthorn, red bud, halesia (silverbell), and double blossom Japanese cherry hold their blooms fairly well. Magnolia, Higan cherry, and crab apple do not hold their blossoms very long. But we miss the fragrance of some varieties of magnolia, and thus the fragrance of flowering bulbs and roses is all the more appreciated. They are about the only plants that may be relied upon to perfume the air. Birch trees are always beautiful in the Show, and they force easily as do all the varieties of Japanese maple. The weeping willow provides height and creates graceful effects.

It is nice to have a few accent plants in a garden. A weeping tree, a white dogwood in front of a background of white pines, a display of water, brightly colored bulbs blooming in front of a bank of white azalea, an espalier against a wall, or a plant hanging from or growing over a boulder—all of these are appreciated in the proper setting.

After you've participated in flower shows a few years, you usually develop enough confidence to bring a wider variety of plants into the Show. The Flower & Garden Show is a fine place to introduce rare and unusual plants or difficult to force plants that are beautiful and should be put in more gardens. Our firm has been successful in forcing Halesia tetraptera (Carolina silverbell), Styrax japonica (Japanese snowbell), and Chionanthus virginica (white fringe-tree). All three of these trees create with their hanging flowers a soft, white lacy effect. There are interesting evergreens, too, which should be used more than they are, especially in mature sizes. Dwarf Hinoki cypress, a weeping hemlock, a

continued

forcing plants







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The crew at Herb Bieberfeld's County Line Nursery wrap the birch's moist root ball in burlap. They load it onto a tractor to be taken to the greenhouse.

weeping white pine come to mind. Cunninghamia lanceolata (Chinese fir) will grow in protected locations in the Philadelphia area. When forced into new soft greenish-blue growth, this plant captures the eye immediately.

One must bear in mind that the process of forcing doesn't bring out as vivid or as vigorous a bloom as when Mother Nature does it her way in the out of doors. A Kwanzan cherry isn't as pink, a red Japanese maple isn't as brilliant, nor the color of a rhododendron as intense as when they break into new life in their own time.

Another consideration to keep in mind for a garden in the Show is the relatedness of blooming time. We attempt to present plants that bloom within a reasonable time of each other. For example, flowering trees that bloom about the time of azalea and rhododendron should be used with these plants. *Cornus kousa* or magnolia are a little out of place because they bloom before azalea and rhododendron or after them.

The selection of colors is important. Red, purple and yellow will immediately attract the eye. Keep in mind though that strong colors are like a sign board: they are too powerful and exciting to look at for a long time. Much more restful, refreshing, and relaxing are whites and soft pinks. I believe our most rewarding exhibit was first conceived as an effort to use these colors. We used white tulips with pink stripes, pink Kwanzan cherry, white dogwood, four or five varieties of pink or white rhododendron, an equal number of pink and white azalea, and white Pieris japonica. Only one or two splashes of red in the form of azalea and rhododendron were used as accents. The remaining plants were evergreens, which were used as fillers. A very restful atmosphere around the patio was the net result.

forcing the plants

Plants to be forced should be dug in late November or early December and healed in deep mulch. To save space and your backbone the balls of earth around the roots may be dug relatively small; the plants will still come to life. A good example is forsythia forcing which needs no earth or roots to make it break dormancy. Tin containers, various types of farm baskets or no-rot burlap should be used. Regular burlap will rot before the forcing time is finished. Evergreens should be placed

inside an unheated plastic house. Plastic houses are simply and efficiently constructed. With 2 x 4 lumber an 'A" frame structure is easily made and is tall enough to walk in. Over this frame 4 mil plastic is stretched and nailed or stapled onto the 2 x 4's. Such a structure is tighter than a glass house. When outside temperatures go down to 0°F, the inside temperature may dip to 20°F., and no wind will blow against the plants. Ample water inside will prevent severe freezing; besides sprinkling, tubs of water are used. The humidity in such a house is better controlled than when the plants are outside. Also a rich green will be preserved in the needles or leaves. The house will protect azalea and rhododendron and pieris until the time comes to bring them into a heated house. If these plants are dug in frozen ground and moved directly into a heated house, the chances are good that some of the buds will not bloom, and it is likely that many leaves will fall off.

Once plants are dug, healed in, and adequately watered, the chief consideration is when to apply heat and how much. Information on the subject is limited. Before our first exhibit I spent a good month, researching and corresponding, in an effort to learn all I could about temperatures and number of days needed to force a specific plant. Never did I spend a more frustrating time. Not even the Pennsylvania Horticultural Society nor the Massachusetts Horticultural Society could locate much pertinent information. The best information came from comrades exhibiting in the Show. But even they could not be exact. For example, when a nurseryman looked over his diary from earlier years, he noted that in 1962 he had forced azaleas in four weeks, but in 1963 it took six weeks. He concluded we had more cloudy days in 1963. Also exhibitors had different ideas about forcing houses, type of heat used, and methods of watering. So with that information I decided that my own common sense would have to carry the day. Accordingly, I began listing the days the plants normally bloom: late March for forsythia and early May for azalea. It is obvious that it will take less time to force a forsythia than an azalea.

I next worked out how much time I had before the Show. Based on my experience and using a target date of

continued

forcing plants







The tree is eased into the greenhouse. It rests on its side over a support until it is removed for the Show.

March 10 for the Show, I listed some dates when plants should be introduced to heat in order to bring them from dormancy to bud, ready to burst. If flowers are fully open at the beginning of the Show, the chances are that they will be sadly faded by the closing.

Plant Date to Apply Heat

Rhododendron Late December Mid-January

Birch, Japanese maple, hawthorn Japanese cherry & flowering crab

Pieris japonica Date to Apply Heat

Late December Mid-January

February 1

February 1

February 10

February 15-20

Many factors must be considered in the heated house. The temperature should not start out any higher than 50°. High humidity is also important. The temperature will vary in different places in the heated area, particularly in higher elevations of the house where it is warmest and corners where it is cooler. If winter weather is cloudy, plants will respond slowly, for not only does light have a beneficial effect, but also on a sunny day the temperature will be raised by the sun's heat. Night temperature should be raised 5° every two weeks. Temperatures in the 80's will probably be needed to speed up plants during the last week of forcing. When the temperature is that high, along with the high humidity, there is some danger fungus will set in. Careful spraying with a preventive fungicide, such as capton, to which plants are tolerant should be used. During the two months of forcing, plants may have to be moved around like musical chairs. Some will come to life too fast and some too slowly. It is desirable to have a cool area where night temperatures can be held in the low 40's. This necessitates the luxury of a second house that can be heated for extremely cold weather, yet will maintain a 40° temperature on a warm sunny day.

My efforts to try to slow plants in a garage where there was no minimum heat proved disastrous when an unexpected cold night nipped the new growth on a dogwood; equally disastrous was storing a premature advanced Kwanzan cherry in the barn where a cow could not resist stretching her neck across a partition to feast on pink and green succulents!

Because of so many variables, I have found that it's good insurance to dig more plants than are needed. Most

of a variety should be placed in the forcing house on the date estimated to bring them into bloom for the Show. A few should be started a week before that, and a few a week after the main group. Not many varieties of azalea and rhododendron will bloom at the same time—usually they bloom a few days apart. You can see that if back-up plants are dug for each variety, quite a few plants are involved. Every year, however, we have found that this extra precaution has saved the day.

setting up at the show

The gardens are installed at the Civic Center during the week before the Flower & Garden Show opens. Since weather is undependable in early March, you hope you'll have a warm day to move the plants to the Show. I wrap the plants with plastic or burlap. A closed truck is essential, and when the temperature is in the low 30's space heaters may be needed.

We've loaded trucks in the rain when tractor tires churned the thawing ground into a quagmire, and we've had tractors hopelessly stuck on snow or ice with our prize blooming dogwood crying to come in out of the cold.

When the trucks are all loaded, we turn our backs on the forcing house where we have spent so many hours watering and moving plants from one location to another. Behind, we are leaving those plants that bloomed too early, those that were too contrary to bloom at all, and those that we damaged by handling. The Show must go on, and the complete disorder of the greenhouse is of little consequence as the trucks grind down the lane in the snow or mud to the highway.

Installing the exhibit takes four to six men a week at the Civic Center. With the design and creative picture in mind, the sand, mulch, stone, timbers, water pools, as well as plants easily fall into place. With a little luck and much hard work a splash of beauty is created right in the steel grey of the Civic Center. As much as an exhibitor may have doubted his wisdom when subjecting himself and crew to such effort and anxiety, he and they can now relax. As they prepare to go home, they may look over their shoulders at their creation, and the feeling swells overwhelmingly that "this wasn't a bad way to spend the winter after all. We are ready for spring."

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digging for information

HORTICULTURAL CORRESPONDENCE

creating a meadow

Q. We are just completing a vacation house up at Eagles Mere. Construction has necessitated digging one area to install a septic tank system. The area involved is in the woods, in what I would think would be termed as "light shade." Before the woods were thinned, the ground was covered by a growth of ferns, but the digging has pretty much destroyed the top mulch and has produced a soil that is rocky, but passable. It has a number of large trees, all of which are quite tall, permitting considerable sunlight to filter through and along the edges of the cleared area. What I would like to do is to seed some type of grass or wildflower, or both, to produce a meadowlike appearance beneath the tall trees. The area is at an altitude of 2.000 feet with an exposure to the west wind so that it is quite cold in the wintertime, although it is correspondingly cool in the summer. Can you give me any suggestions? R.S.R., Bryn Mawr, Pa.

A. Not having seen the actual location makes it difficult to offer specific suggestions. However, I can offer you a general suggestion, based on what I would do if I were in your situation. Contact a local seed store around Eagles Mere and have them recommend a native grass that does well. The disturbed areas should then be seeded with the recommended mixture. To help create a more meadowlike appearance I would then seed a variety of wildflower seeds in different sections. From that point I would let nature take care of it. Attached is a list of wildflower seed sources. You will, of course, want to examine their catalogs, being especially careful to make sure that any seeds you choose are hardy for your area. and are ones that will grow and bloom in the shade.

tree for small city garden

Q. We have a small city garden approximately 12' x 14'. We would like to have a tree in that area but do not want to choose one that will grow too large. We were thinking of a hawthorn; can you offer any further suggestions?

W.L.E., Philadelphia, Pa.

A. I think your choice of a hawthorn tree is excellent. As you suggested, it is

wise not to overplant the small area. I've listed two additional suggestions. Star magnolia. *Magnolia stellata*, grows



by Ed Lindemann, horticulturist

to about 20', although it may be kept at almost any desired height. It can either be trained as a large shrub or a small tree. It is one of the earliest blooming plants, producing lovely starshaped white flowers in April before the leaves appear.

Crab apple, *Malus sp.* Many varieties of crab apple only reach a height of about 20'. Depending on the variety, these plants bloom from late spring through early summer with flowers ranging from almost white to almost red.

As a PHS member you are entitled to borrow books from our library for a period of three weeks. You might find Donald Wyman's Crab Apples for America interesting. It's available for loan from our library and will be sent to you upon request. We also have available a list of Disease Resistant Crab Apples prepared by plant pathologist Lester Nichols which you might like to read.

mock orange

Q. Can you identify the enclosed? It grows wild around the railroad tracks. I can't locate it in my wildflower or shrub book.

G.R., Glenside, Pa.

A. The plant that you are trying to identify is a type of mock orange, known botanically as *Philadelphus*. There are many varieties of mock orange that can be found in the Delaware Valley. Mock orange will grow well in any good soil and requires very little attention. It is best to prune them every few years.

support for clematis

Q. We had a fence 10' from the house that ran across the front of the house, but it has been removed. A bed with flowers and bushes remains. That is acceptable, but where each of the four fence posts were, we have some large clematis—a jackmanii, henryii and some others. These covered the fence posts and trailed along the horizontal rungs. Is there something we could buy to hold these beautiful clematis up other than just replacing the fence?

Mrs. R.C.M., Cherry Hill, N.J.

A. There are several ways to solve the problem. Redwood or cedar $4^{\prime\prime} \times 4^{\prime\prime}$ posts set well into the ground with a small steel cable either attached to the

posts or run through them is an easy and practical solution. The posts will weather well and blend into the land-scape and the steel cable will be almost invisible. I have seen this method used with wisteria and it has worked well. Another solution might be to use panels of plastic coated welded wire fencing cut to a desired size and supported either with wooden or steel posts.

bonsai

Q. I just received a bonsai tree for a gift. I like it but do not know how to care for it. Any information you can give me would be appreciated.

M.D., Philadelphia, Pa.

A. It would be difficult for me to tell you how to care for your bonsai by letter. Bonsai is the art of growing and training dwarf plants in a small container; it is not a species of plant. In order to keep your plant beautiful you will need to learn the basic practices of bonsai and also the care required for the specific genus of plant material.

The Brooklyn Botanic Garden Handbook on Bonsai is available from PHS and is an excellent guide for beginners. In addition, I am sending you a brochure from the American Bonsai Society, which publishes a quarterly, and of the Pennsylvania Bonsai Society, which sponsors activities for its members.

hydrangea

Q. About three years ago my son bought me a beautiful deep pink hydrangea plant for Mother's Day. I trans-

planted it to my garden. I now have a beautiful green bush that never blooms. Could you please tell me how I can get it to bloom?

C.W., Philadelphia, Pa.

A. There are several reasons why your hydrangea plant has not bloomed. Hydrangea plants need full sun in order to bloom; if your plant does not receive full sun, I recommend that you move it to a spot in your yard where it will. Hydrangea plants bloom on the current year's growth; in the winter, after all of the leaves have dropped and nothing but the stalks are left, cut the stalks back to the ground. A new growth will come up the next spring. If your plant has not been fed, I suggest feeding it with a general fertilizer such as 5-10-5 following the directions on the package.

classified ads

Newly published reprint of Witmer Stone's classic 950-page hard-bound book on the plants of the Jersey Pine Barrens: *The Plants of Southern New Jersey*. \$25.00 POSTPAID. Quarterman Publications, 5 South Union St., Lawrence, Mass. 01845.

AFRICAN VIOLETS. African Violet color catalog send 20¢. Greenhouses open daily and Sunday afternoon. We carry full line violet accessories, pots, violet jars, terrariums, fluorescent lighting equipment. TINARI GREENHOUSES, 2325 Valley Road, Box 190, Huntingdon Valley, PA 19006.

Polly Fairman's Indoor Bonsai and Japanese Gardens, 103 Mt. Lucas Road, Princeton, New Jersey 08540. By appointment. 609-924-3202. Indoor Bonsai. Gifts for plant loving friends and relatives. Supplies, planters. Saturday morning clinics for all Bonsai problems. Japanese landscaping. Lectures for garden clubs.

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Alpine and Rock Garden Plants - Troughs - Greenwood Farms Nurseries, 1421 Ship Rd., West Chester, Pa. 19380. Call for appointment 215-696-8020.

Would like to obtain: Rhodotypos scandens, Meratia (Chimonanthus) praecox, Rhododendron racemosum. Reply to L. W. Zimmerman, c/o PHS. DR. MARTIN POLE LIMA BEAN SEED is available from Fern Hill Farm, Jessup Mill Road, Clarksboro, NJ 08020, at \$1.00/pkt. (12 seeds) + 25¢ postage per order.

BONSAI AND SAIKEI CLASSES. Beginning and advanced techniques. Also indoor bonsai and rock plantings. Our ninth consecutive year—1973 schedule available. Dorothy S. Young, Keith Valley Nursery, McKean Road, Spring House, Pa. 19477. Telephone (215) MI 6-8915.

Advertising copy should be submitted 8 weeks before issue date: November, January, March, May, July, September. Minimum rate \$5.50 (covers up to 35 words). Additional words 20¢ each. Less 10% discount for two or more consecutive issues, using same copy. All copy should be accompanied by check made out to PENNSYLVANIA HORTICULTURAL SOCIETY and sent to Patricia M. Cain, THE GREEN SCENE, 325 Walnut Street, Philadelphia, PA 19106.

fighting the gypsy moth with a slingshot?

by Jean Byrne

In early July Perot Walker, a teacher at Chestnut Hill Academy, set out for Hawk Mountain near Reading in Berks County with two young students for an overnight camping trip. When they arrived they found a desolate landscape. No cooling leaves filtered the sunlight. Rather the trees, bereft of foliage, were festooned with millions of gypsy moth caterpillars. Some were contentedly finishing the few remnants of oak leaves available. Others were dead or resting on the forest floor, having eaten their way "through two mountains," as one woman put it. Still others dropped unceasingly on the picnic tables and tents that the campers set up. They fell indiscriminately on people and cars; the roads were slippery with them and Walker reports the air was fetid with their decay. The campers discovered that the caterpillars had eaten their way not only through the broadleaved hardwoods, but had taken on the hemlocks as well. The only thing left intact, said the disconsolate Walker, were some grapevines.3

While oak is the gypsy moth's primary host, any one of 150 plants will suffice. This is why gypsy moth is particularly dangerous; it is the only forest insect that will feed on both hardwoods and conifers. Studies show that two consecutive years of heavy defoliation (over 60% of the leaves removed) will kill roughly 30% of the oaks and after three years, 60%. Hemlocks, as well as many of the pines and spruces, will die in one year if completely stripped of their foliage.

When the gypsy moth cleans out an area, it may die of starvation or move out into surrounding communities as it did in Saylorsburg in 1971. Millions of hungry caterpillars migrated to the town after defoliating the surrounding woodlands. They consumed grass, shrubbery, flowers, tree foliage and, according to reports from the Pennsylvania Department of Environmental Resources (DER), "crawled into the houses, creating a near panic among local residents." In July of 1972 DER reported that near Hamburg in Berks County, "a YWCA camp had to close

*Berks County reported 32,480 acres stripped by the gypsy moth.

down, outdoor life was impossible, and in many cases so was indoor life as the larvae (caterpillars) swarmed over and entered buildings...one woman we know had to be hospitalized as a mental case. Others were all set to sell out and move elsewhere."

Invasion of Pennsylvania. The gypsy moth came to Pennsylvania by way of Massachusetts in 1932. It came to Massachusetts via Europe more than 100 years ago, and New England has lived uneasily with the pest ever since. The gypsy moth infested a 400-sq. mile area, Luzerne and Lackawanna counties, in 1932 and by 1935 it had spread to two or three eastern counties. The infestations were kept under control for 10 years with lead arsenate, Beginning in 1943, and at intervals over the next 20 years, infestations were treated with DDT. The moth's spread was minimal during this period and DER reported a little over a year ago that "no surviving caterpillars were ever detected in a DDT-treated area. . . . Since 1963, when DDT was abandoned in favor of less persistent and less effective insecticides, the insect began its march across Pennsylvania. . . . It is probably safe to say that now the entire state is infested, but it will be a few years before noticeable tree damage appears in the western counties. Other states to the south and west are rapidly becoming infested, and it is expected that the insect will eventually occupy all of the oak regions of the Great Plains.'

"Since 1963, when DDT was abandoned in favor of less persistent and less effective insecticides, the insect began its march across Pennsylvania."

Pennsylvania Department of Environmental Resources

In 1972 total heavy defoliation statewide was up 352% over 1971; aerial surveys show that 404,060 acres were defoliated by the gypsy moth. Most of that defoliation was in the heavy to complete category.

What makes Pennsylvania such a bull's-eye target for the gypsy moth is that 10 million of our 17 million acres

of forest lands consist of oak trees. These monotypic oak stands grew up after uncontrolled cutting of the original forests, forest fires and the disappearance of chestnut trees; some pundits say that we are going to have to face losing a large part of these stands. but that it might not be a completely bad thing. Speaking to that point in October 1972, entomologist John W. Quimby of DER said at a gypsy moth conference: "[N]either the state nor the federal governments can stop the build-up and spread of the gypsy moth with current tools available." (Author's italics.) Quimby went on to say that DER's ultimate goal to reduce composition of the present stands of oak to 15-20% oak is sound forest management. They believe that taking out the raw materials before the gypsy moth does will lessen not only the gypsy moth hazard to the oaks now and in the future, but also the real hazard posed by the other insects that depend on oak leaves for food. The race is to the swift and it remains to be seen if public opinion, bureaucracy, special interest groups and the theorists can mobilize themselves rapidly enough to outdistance the implacable furry noshers.

The Weapons. The conference at which Quimby spoke in October was held at Ridley Creek State Park by the Tri-County Conservancy. It was a gathering of experts who were to tell the public what was being done to combat the gypsy moth. The disinterested public stayed away in droves. The few experts were really talking to each other except for four or five people who did come to learn. And in spite of the tentative note of optimism on which the meeting ended, it was hard to find much comfort in the proffered solutions. As with all long-term solutions, it is hard to imagine how we are going to get through the transition period.

Representatives from the Department of Environmental Resources, the agency in Pennsylvania responsible for protecting Pennsylvania's forest lands, and the USDA Forest Service, Northeastern Area, State and Private Forestry, attended. Both agencies are firmly against "crisis management," that is, they are against wholesale spraying.



They see such a policy as sustaining monotypic, artificial forest environments. They believe that periodic spraying with nonpersistent pesticides would become necessary indefinitely. Quimby pointed out that such spraying operations from 1964 to 1971 could not contain the gypsy moth to limited areas of northeastern Pennsylvania. He believes that several methods will have to be used to get rid of the pest: "The only realistic way to confront this insect is to introduce those parasites, predators, and diseases that would relegate it to a population below the economic injury level."

Here is a partial listing of some of the weapons being developed to combat the pest in 1973. DER believes the primary effort in combating the gypsy moth lies in rearing, releasing and establishment and evaluation of imported natural parasites.

Biological Laboratory and Rearing Program. The gypsy moth is an introduced insect from Europe where it has approximately 77 known parasites and insect predators. New England, where it first appeared, imported over 40 species of parasites and predators; only nine have become established there. It's hoped that Pennsylvania's environment will prove more hospitable to some of those that did not survive in New England.

Some parasites were raised and released in Pennsylvania in the summer of 1972. However, a fire destroyed the laboratories and later lease problems have hampered efforts to establish the new laboratories. Work on the scale planned for the summer of 1973 has been slowed down considerably. A word of caution about parasite and predator programs was sounded by Dale O. Van Denberg of the USDA Forest Service, Northeastern Area: "[L]arge quantities of exotic parasites and predators are imported, reared and released to do their job. . . Often these releases are made with the finest intentions, but with admitted incomplete knowledge of the parasite or predator's requirements for survival and without any sound evidence of their effectiveness in an alien environment or full knowledge of their interactions with native species." DER counters such an argument by saying that "... introduced parasites and predators will be carefully screened and quarantined so they will not themselves become environmental hazards."



July in Carbon County, Pennsylvania. Trees were defoliated by gypsy moth.



A caterpillar-intested summer cottage near Hawk Mountain.

Bacillus thuringiensis (Bt). Other states have held out high hopes for Bt as an effective method of control; however, spraying in 1800 acres in Pennsylvania gave only erratic degrees of control. Egg mass reduction varied from a high of 84% to an actual increase of 316%. Bt is four times as expensive as some of the chemical sprays being used at present.

Disease. One sweeping population control that occurs naturally is wilt disease, a polyhedral virus. The disease is present in colonies in a latent form and breaks out when the caterpillars are starving or when high relative humidity occurs over a lengthy period. Unfortunately it often does not occur until after a forest stand undergoes two or three years of heavy defoliation.

Laboratory-created viruses planned to trigger epidemics will not be ready until around 1976.

Sex Attractant. Disparlure, a material that attracts male moths to female moths has been chemically isolated. It will be used to confuse the male and to prevent mating. It is now being used to detect new infestations.

Chemical Sprays. At the present time, Sevin and Dylox* seem to be the most effective means of controlling the gypsy moth. However as stated before, DER is not committing themselves to a method they consider never-ending. In 1973, although they have received requests from communities to treat areas exceeding 100,000 acres, they have funds to treat only 50,000 acres. The acreage to be treated through public fund proposals has been restricted according to Maurice K. Goddard, Secretary of Environmental Resources, to areas highly used by the general public or taxpayer. The principal included sites are public parks or recreational areas, non-profit campgrounds, forested communities, roadside strips in rural residential areas and buffer zones surrounding communities.

Goddard believes that widespread or massive forest spraying is not good

Both agencies are firmly against "crisis management," that is, they are against wholesale spraying.

policy since data shows that nonpersistent spray materials will provide only 90% control. He points out that surviving insects "repopulate to destructive levels in two years so massive spraying would likely be a never-ending and escalating program. On the other hand, the gypsy moth population will collapse of its own weight after two years of severe tree defoliation and to interfere with this collapse would be self-defeating."

Tactics for Individuals. The best defense for valuable trees on homeowner's property is constant maintenance. Paul McFarland, president of the Delaware Valley Horticultural Council, points out that oak trees in the area are just beginning to recover from the effects of the long drought period that preceded our last two rainy years. McFar-

land suggests contacting an arborist to check your oak trees and to set up a fertilizing and a spraying schedule. Both schedules should be set up for May; the spraying should be done when the foliage is one-third to one-half out. One spraying should be sufficient but constant watch for gypsy moth egg masses should be kept for the next couple of years. McFarland also suggested contacting the arborist right away since if the anticipated migration of gypsy moth comes to this area getting an arborist will be both difficult and probably more expensive. Good ongoing care is considerably less expensive than removing a dead tree from your property.

The gypsy moth lays its eggs between July and September. The eggs overwinter in masses attached to trees, stones, walls, logs, and other objects. Each egg mass can contain up to 1,000 eggs although the average is 400-500 eggs. Check your trees any time between now and April. If you find these buff-colored masses, scrape them from the trees or other resting places and burn, bury or boil them. You can also destroy them by painting with a mixture of ½ creosote and ½ kerosene. Your efforts will be fruitless however if you leave enough eggs around. One caterpillar can eat four leaves a day. So be sure to look under rocks, logs, loose bark and other inviting hiding places. And be sure to check your car thoroughly when returning from infested

Gypsy moth caterpillars also can be trapped by tying a band of burlap around tree trunks. Caterpillars that descend to rest during the day find the burlap an ideal resting place. The burlap strip should be 8" to 1" wide, held in place by a cord tied in the center about shoulder height. The upper half of the band should be folded down over the lower. The caterpillars will congregate under the folded portion. Bands should be on the trees from late May through mid-July and inspected daily. This method will effectively prevent heavy defoliation of valuable shade trees. Also check for larvae (caterpillars) in bark crevices, under loose bark and in loose groundlitter. A 6" band of sticky tanglefoot (available from nurseries) applied around tree trunks is an alternate method of stopping the larvae but may not be as effective and is messier. The pupae found from late June to late July may also be collected

and destroyed wherever found.

These then are the possible ways to fight the gypsy moth. If Pennsylvanians appear to be confronting this consumer of oak forests with a slingshot, it is small wonder. It's hard to believe that such little creatures can so disrupt our economy, our recreation and our general sense of being in control. But they can. It may be that an eclectic system of controls is the only one that will work; if so, it requires cooperation from everyone; no one can fight the battle alone. Get behind your community. Pressure your local government to act in an informed way. After all, look where the slingshot got David.

community action

The Pennsylvania Department of Environmental Resources developed the Cooperative Assistance Program to make available the Department's professional foresters and forest pest control staff to help the public in forest pest problems. An annual aerial and ground surveillance program is conducted and mapped on all forest land to detect pest infestations, their severity and trends.

On request, DER will advise county, township and municipal government and individuals in methods of alleviating forest pest problems in critical areas and in a manner that will not interfere with the overall biological control program. Local governments may request the Department to conduct a forest insect or disease survey in specific high-use areas and to evaluate the potential of the problem. Department entomologists and pathologists will provide their best judgment as to the proper course of action.

Contact:

Pennsylvania Department of Environmental Resources Bureau of Forestry, Forest Advisory Services Insect and Disease Branch P.O. Box 1467 Harrisburg, PA 17120

Literature about the gypsy moth is available from:

The USDA Forest Service Northeastern Area State & Private Forestry 6816 Market Street Upper Darby, PA 19082

^{*}Dylox is being used experimentally. It is not registered for use against the gypsy moth. Its advantage is that it does not kill bees or aquatic organisms.



Miniature daffodils — those tiny charmers that stretch the blooming season — why aren't they planted more widely? Do their exquisite proportions and size lead people to think they are too "iffy," too delicate, too tender? They are not.

A true miniature is a scale model of a standard daffodil in all of its parts; it is not just a flower with a short stem. More than a hundred are listed and growers and hybridizers are always adding new introductions. Like the standard daffodils, miniatures are single, double, one or more to a stem, yellow, white or a combination of white and yellow or orange and yellow. They range in height from 4" to 10" and bloom early, mid-season and late. They have fascinating names like the Little Gentleman, Frosty Morn, Pixie and Curlylocks.

As with any other plant you must select the right variety for your particular problem, plan or color scheme. *Narcissus asturiensis* (N. minimus) is blooming outdoors right now. It is a species, classified as Division X and is a perfect, tiny, all yellow trumpet about 4" tall, hardy and reliable year after year.

Little Beauty, a 6" bicolor, is a very early bloomer along with Sneezy and Tanagra; both are solid yellow. Bambi blooms late in March or early April for me and experts recommend it as a good garden flower because it multiplies; however, I find it doesn't do well for



by Nancy S. Timms

Nancy S. Timms is a charter member of the American Daffodil Society. An amateur gardener, she is a Barnes alumna. She is actively involved in PHS activities, a member of the Council and is chairwoman of the PHS Awards Committee.

me. Maybe you will have more luck. Others blooming about the same time are Cyclataz about 7" tall with three or four flowers to a stem (the perianth is yellow with an orange cup); Flomay is white with a yellowish edge to the cup; Snipe is all white.

A taller one is Lintie, which goes to about 10" and like Xit and Yellow Xit is valuable because it comes into bloom late, after April 22; at least that has been my earliest blooming date. It is about 8" tall. There seems to be some confusion about these two clones but that is of concern only if you are exhibiting when it is absolutely necessary to have each flower correctly named. As garden and show flowers both are excellent and have been blue ribbon winners consistently.

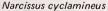
I've barely skimmed the surface; as you read, visit gardens and flower shows, you will become enchanted with the possibilities of miniatures in your own garden. Miniature daffodils in rock gardens and topping low walls are classic. Why not try something different and plant a few in window boxes, porch boxes or terrace planters? These come into bloom during the anxious days of late winter and early spring when you are eager to get out into the garden. I have planted the Hoop Petticoat, Snipe and W. P. Milner with success and others too in a terrace box and when they bloom it is such a joy to look out at them. I use plastic berry boxes, or wide-mouthed tin cans with both ends removed. I fill them with compost, loam and gritty sand. I sink the bulbs about 2" deep, with the top at ground level in the planter and a skim of dirt to cover the edges of the plastic boxes. These miniature bulbs are quite small so you must use your judgment about the exact depth. The general rule of thumb is about twice the depth of the bulb. When using cans be sure you have one broad enough to allow roots to grow comfortably. The advantage of this method is that they can be lifted after blooming and sunk into another part of the garden to cure and dry off while the planter is filled with seasonal material. These unexpected bits of color will produce more fun than you can imagine; they seem to enchant everybody. Gardeners in this country are amused at the idea of planter boxes, which are used so widely on the continent, but I think more of it should be done here in the States.

Forcing bulbs in pots for winter enjoyment in the house has been done since early times with little variation or improvement today other than controlled temperatures—thanks to modern refrigeration. Pencrebar, a little double yellow having two or more to a stem forces easily as does Sundial with its flat, neat, well-rounded perianth. I use small azalea pots or bonsai pots as containers because they are better proportioned than the traditionally shaped taller flower pot. I have never been successful holding forced miniatures over to rebloom a second time.

Miniatures are perfect to tuck into odd spots in the landscape, in a raised bed, or at the base of a tree. Most can be planted quite close to one another and are content with a stony soil not too fertile. Good drainage is paramount, plus plenty of sun during the hot summer months for a good baking. *N. cyclamineus*, an exception, is happier in a moist situation. If draught comes, water once a week; the roots are only two or three inches below the surface in most cases and you don't want them to dry out.

The complaints that miniatures are short-lived, disappearing, sterile, bloom only one year and then run to foliage are, unfortunately, all too true. The Hoop Petticoat never blooms the second year for me, but I replace it frequently as it is plentiful and inexpensive. But my sweet smelling N. jonquilla has been in the same spot for a dozen years and multiplies. The Xits, Wee Bee and Tanagra bloom contently for years. Cobweb and Bebop leave me after a few seasons. The species seem to need more care and attention than the hybrids. The species and wild forms are thought to multiply from seed rather than from offsets.

For an early sping in your garden, plant miniature daffodils. The American Daffodil Society, 89 Chichester Rd., New Canaan, Connecticut 06840, has an approved list of miniatures if you who are interested in growing true miniatures are opposed to small daffodils.





Narcissus bulbocodium



Longwood Gardens photographs



THREE-STORIED VEGETABLE GARDEN

by Henry D. Mirick

Architect Henry D. Mirick often brings his planning skills to horticulture. He won the PHS Horticultural Award for his humming-bird house design at the Philadelphia Zoo. Also, he designed the plans for the setting of the Gazebo at the 1973 Philadelphia Flower & Garden Show. He is an expert at growing vegetables and an accomplished photographer of wildflowers. Mr. Mirick is a member of the PHS Council.

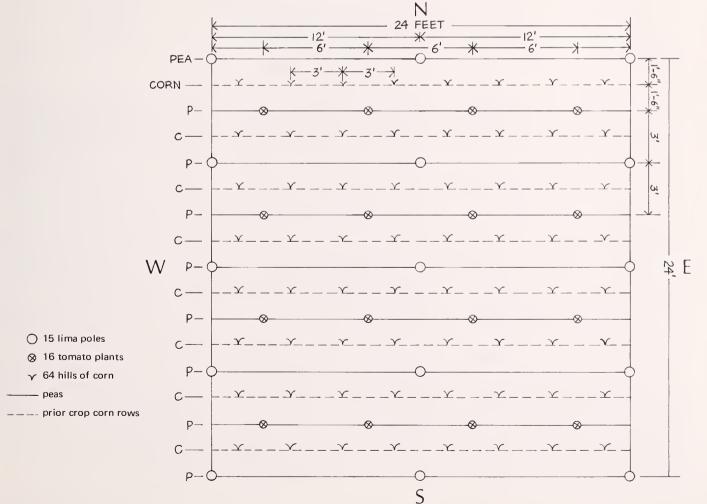
Many people never have a vegetable garden for the simple reason that it does not seem practical to grow enough vegetables for an average family on a small suburban lot. It can however be done.

Basic requirements for such a garden include a reasonably level 24' by 24' plot of ground, plenty of sun, good friable soil, and liberal applications of lime and commercial fertilizer. It also includes a 12" rake, a hoe, a three-prong cultivator and some ingenuity.

To best use a small suburban lot and to produce a continuous supply of fresh vegetables from early spring to late fall, the unorthodox procedure that I developed may be of interest. First, there should be no bare spots in the garden that require tedious summer cultivation. And since peas, corn, tomatoes and lima beans are generally favored for the home garden, particular attention should be given to them.

Next, you should make a drawing of your little garden. Lay it out on a convenient scale such as ¼ inch per foot. Since spring peas are generally considered the most popular early crop, plan to have the peas, nine rows of them, spaced 3' apart, laid out east to west. Draw these pea rows in with a solid line. Between the nine main crop rows, draw eight intermediate rows with a dashed broken line. These will be rows planted later in corn. Since the peas are planted at the end of March and are harvested early, each pea row can have a follow crop. Follow crops for the peas should be planted as soon as the pea vines are removed. Since the corn is planted later, each of the eight intermediate corn rows can have a prior crop planted at the time the peas are planted, that is, at the end of March. These early prior crops include radishes, spinach, curly lettuce, bunching onions, transplanted beets, all of which will be ready for harvest by late May. They will not interfere with corn, which will be planted in the same row by the middle of April in hills 6" to the north and 3' apart. Actually, the "hill" is a cluster of five or six seeds. Allow only the best four stalks to mature. Plant only golden Bantam corn which has a delicious flavor. The stalks are so short they will not cast a heavy shadow on the rest of the garden.

The two other favorites, tomatoes and limas, are quite a challenge for a small garden. Placed in rows by themselves they take too much room and cast such a dense shadow that it is impossible to grow other vegetables beneath them. If placed however on poles



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PLANTING SCHEDULE FOR THREE-STORIED GARDEN

CROP	PLANTED IN ROW	TYPE OF CROP	PLANTING DATE	APPROXIMATE HARVEST DATE
Peas	Pea	Main	Late March	May — June
Radishes Spinach Curly lettuce Bunching onions Transplanted beets	Corn	Prior	Late March	Late May
Corn	Corn	Main	Mid-April	July — August
Tomatoes	Pea Rows 2,4,6,8 6' apart	Main	Plant in pea rows after danger of frost.	Mid-July to September
Pole lima beans	Pea Rows 1,3,5,7,9 12' apart	Main	Start indoors. Plant in pea rows begin- ning of May	August
Cauliflower Carrots Beets Broccoli	Pea Between tomatoes and Iimas	Follow	After pea vines are removed in May & June	August September
Bush string beans Brussel sprouts Egg plants Cabbages	Corn Between corn hills	Follow	After corn is harvested in July	August September October

carefully spaced throughout the garden, their diffused shade will not interfere and may even be useful to other crops during the hot summer months. The 4' and 7' lima poles will be the second and third stories of your garden.

Locate poles for the limas 12' apart in the first, third, fifth, seventh, and ninth pea rows. There will be 15 poles. In the remaining pea rows, place poles for the tomatoes 6' apart. There will be 16 of them. This arrangement will give not quite enough limas but plenty of tomatoes for the average family. All poles should be set in the ground before planting the peas to avoid interfering with the first important crop.

Place tomato plants in the garden after all danger of frost and leave only the first branch on each vine. Pinch off all emerging branches close to the two main stems and secure each vine carefully to its stake to prevent slipping. For best results, limas should be started indoors and set out as soon as the seed has sprouted.

Plant only dwarf peas that require no support. Little Marvel is excellent. Peas may be planted in double furrows 4" apart if the garden is reasonably free of weeds. An innoculant, a nitrogenfixing bacteria in powder form, should be mixed with seed before planting; it provides nitrogen for the entire garden. You can get it from your local garden supply house.

There should be no bare spots in the garden that require tedious summer cultivation.

Now for the follow crops. When the dwarf peas have been harvested and the vines removed from the garden, you are ready to plant the follow crops in the pea rows. Cauliflower, carrots, broccoli and beets are good follow crops for the peas.

Planning the follow crops for the corn rows is a little different. They are

planted in the corn row in the 3' square space between the corn hills. Bush string beans, brussel sprouts, egg plants, and cabbages are suitable for this purpose.

When the last corn has been harvested and the poles for the limas and tomatoes removed, there will suddenly appear a fine healthy fall and early winter garden with an abundance of vegetables for the family long past the first frost. There will be no empty spaces and you will have made maximum use of your small plot throughout the entire growing season.

Your 24' square, three-story garden will require very little cultivation. It should supply more than enough vegetables—192 feet of peas, 30 dozen ears of corn, 15 poles of limas, 16 poles of tomatoes, 216 feet of prior crops, such as spinach, lettuce, onions and beets, and 400 feet of follow crops such as cabbage, brussel sprouts, egg plant and string beans. Its development and care will also provide many pleasant hours of relaxation.



books and the green world

CATALOGS



by Julie Morris

A 1942 seed catalog from the Hosea Waterer Seed Company in Philadelphia tells a curious PHS member when the 'Harold Martin' pole bean was introduced to the trade in this area. The catalog is just one of the collection of current seed and nursery catalogs from all over the world maintained by the PHS Library. Catalogs from nurseries located in the Delaware Valley area are kept permanently as part of our community's gardening heritage. These records of the seed and nursery trade are important chronicles of the development of one of the country's most important industries.

Anyone doing research in the history of ornamental, medicinal or food plants will eventually use a catalog to study a particular plant's commercial introduction and distribution.

The history of cataloging is as interesting as the information catalogs contain. It is known, for example, that the Emperor Charlemagne used a catalog of medicinal plants in a royal decree when

he ordered that the plants listed be grown in each town throughout his dominion, thus establishing an early health-care service.

We are all told to sit by our fireplace on long snowy winter evenings and plan our gardens for the coming seasons. Winter evenings are not the only time to use catalogs, and planning your garden flowers and vegetables are not the only reasons to use catalogs.

Early catalogs listed plants for their virtues rather than as commercial items. Trade was local and bargaining for plants-mostly fruit trees-was carried out in the open markets. A practical 15th Century do-it-yourself guide to gardening, Feat of Gardening, cataloged 200 species of plants in cultivation. In 1596 John Gerard cataloged 1000 plants in use. Gerard's Herbal is part of the PHS rare book collection.

The first known commercial catalog was printed in Paris in 1621. During the same period, London seedmen were issuing broadsides listing their plants and seeds for sale. Extensive seed businesses existed well back into the 17th Century as widespread plant exploration was carried on during the reign of Elizabeth I.

Throughout the colonial days seeds were imported from Europe. After the Revolution the first American seed merchants were established in Philadelphia between 1784 and 1801. These firms added to their importing business the export of seeds of American plants. Their business was stimulated by the collectors and botanists of the area, among them: John Bartram, Peter Kalm, Adam Kuhn, Humphrey Marshall and John Jackson.

Philadelphia was the acknowledged

books and the green world

center of horticulture in the 18th Century, and the establishment of the Pennsylvania Horticultural Society in 1827 was the reasonable outgrowth of all the local interest and talent. One of the first members of the Society was David Landreth whose seed company was first established in 1784. The Landreth catalog has long been part of our permanent collection even though the company moved to Baltimore a few years ago.

The Library lists catalogs alphabetically and by subject. There are over 75 subjects covered and these are very general. However, if we find a source for a hard-to-find plant, it gets a listing all its own

Most gardeners are familiar with a variety of catalogs and we are all told to sit by our fireplace on long snowy winter evenings and plan our gardens for the coming seasons. Winter evenings are not the only time to use catalogs, and planning your garden flowers and vegetables are not the only reasons to use catalogs.

The catalogs described below are useful in themselves. I am not necessarily recommending what they sell but have found the information they contain worthwhile.

The Timm & Co. nursery near Hamburg, Germany, publishes a catalog that is useful to landscape architects, city planners and anyone interested in trees. Labeled with the botanical name of each plant, photographs show the shape and size of many trees. Closeups of leaves, berries and fruits are helpful. Unless you read German the text will be of little use. We often have questions about what a tree looks like without its leaves. The illustrations in the Timm catalog helpfully show trees in their winter state.

There are many tropical plants and unusual bulbs described in the Oakhurst Gardens catalog. This little reference can give you ideas for house plants you've probably never considered.

One of the best references for rhododendron culture is the catalog published by Warren and Susan Baldsiefen. Almost one-half of their catalog is devoted to growing, planting and propagating these popular plants. Southmeadow Fruit Gardens has produced a charming and informative plant list. All types of fruits for the home garden are described along with a history of each plant's introduction. Woodcuts from a 17th Century English work on fruit gardening make the catalog well worth its \$1.00 price.

Our subject file has few entries with only one or two sources. One of these is bamboo. Fortunately the Pacific Bamboo Gardens offer a catalog with complete descriptions of plants available to East and West Coast gardeners. We didn't know where to find a good source for bamboo until a member asked us for one and our checking led to that source.

Seed catalogs are the best known but we too frequently only think of Burpee, Park, Harris or Burnett. These are sources we all know. There are a few sources for unusual seeds and their lists will spark the enthusiasm of the most reluctant seed sower.

Henry Saier and the Nichols catalogs offer descriptions of unusual seeds that make for interesting reading even if you don't want to grow any. Rare house plant seeds are listed in John Brundy's catalog.

Photographs of tropical trees will inspire you to create a Longwood Gardens conservatory in your living room. Clyde Robin's catalog of wild flower and wild tree seeds is a hopeful reminder that we still have sources for native plant material.

As I write this I am surrounded by lists of catalogs I can't possibly include. There are many subjects not covered but that have a file of their own in the Library. All the catalogs we have are available for use in the Library.

Increased printing and mailing costs have made it impossible for many nurseries to send out free lists. Realizing this, it seems that their catalogs are getting better all the time as more and more include helpful information to add to our garden libraries. It would be a shame if we no longer received these optimistic reminders that there is always another gardening season coming and with it another chance to try something new or different in our own gardens.

catalogs

Alberts & Merkle Bros., Inc. 2210 S. Federal Highway Boynton Beach, Florida 33435 (.50¢)

Clyde Robin Seed Catalog Clyde Robin P.O. Box 2091 Castro Valley, California 94546 (\$1.00)

The Merry Gardens Handbook Camden, Maine 04843 (\$1.00)

Nichols Herb and Rare Seeds Nichols Garden Nursery 1190 North Pacific Highway Albany, Oregon 97321

Oakhurst Gardens 345 W. Colorado Street Arcadia, California 91006

Pacific Bamboo Gardens P.O. Box 16145 San Diego, California 92116

Rare Seeds John Brundy's Rare Plant House Box 84 Cocoa Beach, Florida 32931

Roses of Yesterday and Today Tillotson's Roses Brown's Valley Road Watsonville, California 95076

The Saier Catalog of Seeds Harry E. Saier Dimondale, Michigan 48821

Siskiyou Rare Plant Nursery 522 Franquette Street Medford, Oregon 97501

Southmeadow Fruit Gardens 2363 Tilbury Place Birmingham, Michigan 48009 (Plant list - Free; catalog - \$1.00)

Timm & Co. Elmstown Germany

Warren & Susan Baldsiefen Box 88 Bellvale, New York 10912 (\$1.00)

Western Native Plants The Shop in the Sierra Box 1 Midpines, California 95345

RDENS TO VISIT

Listed below are gardens to visit in and around the Delaware Valley area. The list is taken from the Directory of American Horticulture published by the American Horticultural Society and edited by Ernesta D. Ballard. We recommend that before planning to visit any of these gardens you call to see if the hours are still the same since they do change occasionally.

DELAWARE

Winterthur Gardens

Winterthur 19735

99 acres; open April/June, other times with permission. Azaleas, rhododendrons, conifers, bulbs.

NEW JERSEY

Cedar Brook Park

Union County Park System Plainfield 07061

100 acres; open daily. Iris, daffodils, daylilies, peonies, dogwoods, Shakespeare Garden.

Duke Gardens Foundation, Inc.

Rt. 206 South

Somerville 08876

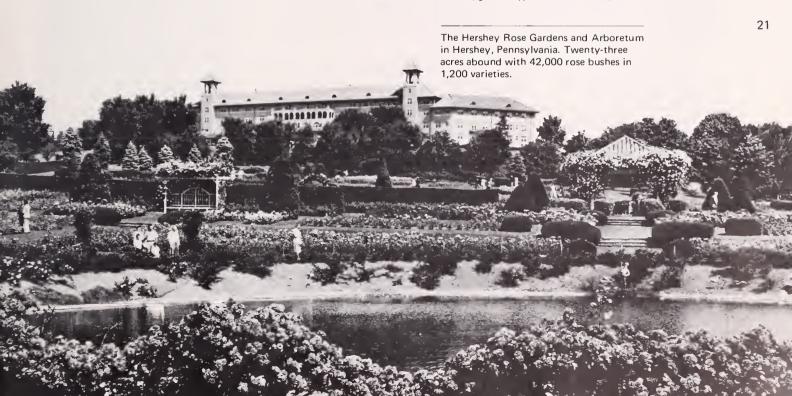
Open summer 1-5, winter noon-4; admission charge. Ornamental flowering plants and tropicals under glass.

Hanover Park Arboretum

Mt. Pleasant Ave.

East Hanover 07936

8 acres; garden type arboretum. continued



GARDENS TO VISIT

Cora Hartshorn Arboretum and Bird

Sanctuary Forest Drive

Short Hills 07078

Open daylight hours Tue. and Thurs. 3:15-5, Sat. 9:30-noon; special exhibits, trail walks. Open membership.

Holmdel Arboretum

Holmdel County Park Longstreet Road Holmdel 07728 Open daily daylight hours.

Princeton University

Princeton 08540

Trees, shrubs and good espaliers on campus. Open daily.

Rutgers Display Gardens

Rutgers University New Brunswick 08902

123 acres; open daily 9 to dusk. Rhododendrons, azaleas, Ilex opaca, Ilex crenata, pyracanthas.

Willowwood Arboretum of Rutgers University

Gladstone 07934

130 acres; open to groups by special arrangement.

PENNSYLVANIA

Arboretum of the Barnes Foundation

300 Latches Lane

Merion Station 19066

11 acres; open by appointment. Magnolias, lilacs, peonies, viburnums, cotoneasters, conifers, Stewartia.

Awbury Arboretum

Washington Lane & Ardleigh St. Germantown 19152 (Mailing address: 8017 Large St.) Open daily daylight hours; 110 species of trees and shrubs.

Bartram's Gardens

54th & Elmwood Streets Philadelphia 19152 Open daily daylight hours; admission charge. America's first botanical garden.

Bowman's Hill State Wildflower Preserve

Washington Crossing State Park Rt. 32 River Road Washington Crossing 18977

100 acres; open daily 9 to sundown; nature walks, guided tours by appointment. Medicinal plant trail, ferns, sphagnum bog plants, plants native to Pennsylvania, wild flowers in spring.

Coover Arboretum

Rt. 3

Dillsburg 17019

12 acres; open by appointment. Native wild flowers, conifers, nut trees, boxwood, holly oak, rhododendrons.

Elan Memorial Park

203 E. Front St. Berwick 18603

88 acres; open daily; chrysanthemums, lilacs.

Ellis School Arboretum

Newtown Square 19073 Open daily daylight hours; shade and flowering trees.

Greensburg Garden and Civic Center

951 Old Salem Road Greensburg 15601

Arboretum, gift shop, flower shows, workshops, exhibitions. Shrubs and trees hardy in Zone 5.

Hershey Rose Gardens and Arboretum Hershey 17033

23 acres; open daily Apr. 15-Dec. 1. 1,200 varieties of roses; holly, hemerocallis, dwarf evergreens, azaleas, rhododendrons, tulips, annuals and chrysanthemums. New heather and herb garden.

Independence National Historical Park

Philadelphia 19106

18th century garden, old roses, magnolia garden.

Longwood Gardens

Kennett Square 19348

1,000 acres; open daily. Tropical and subtropical ornamentals, orchids, camellias, azaleas, large trees. Admission 50¢ weekdays: \$1.00 Sundays and holidays. Children under 6, free.

Masonic Homes Arboretum

Elizabethtown 17022

5 acres; open daily; formal garden, ever-

Mont Alto Arboretum

Pennsylvania State University Mont Alto 17237 39 acres; open daily; trees and shrubs.

Morris Arboretum of the University of Pennsylvania

Rt. 422, Chestnut Hill Philadelphia 19118

(Mailing address: 9414 Meadowbrook Ave.) 170 acres; open Mon./Fri. 9-4, Sat./Sun. 9-5. Open membership; courses, tours. Roses, hollies, ivy, azaleas, rhododendrons, magnolias, dogwoods. Morris Arboretum Bulletin and a newsletter.

Neighborhood Garden Association of Philadelphia, Inc.

3723 Mt. Vernon St.

Philadelphia 19104

One block of demonstration inner city gardens.

Phipps Conservatory

Schenley Park Pittsburgh 15213

2.5 acres; open daily 9-5. Orchids, cacti, tropical and subtropical plants.

Reading Public Museum & Art Gallery

500 Museum Road

Reading 19602

25 acres; daily daylight hours; indigenous and exotic trees and shrubs.

Arthur Hoyt Scott Horticultural Foundation

Swarthmore College

Swarthmore 19081

250 acres; magnolias, cherries, crabapples, lilacs, rhododendrons, peonies.

Swiss Pines Park

Box 127, Charlestown Rd. Malvern 19355

10 acres; open Mon./Fri. 10-4 and Sat. morning. Japanese and Polynesian gardens; native ferns and plants; rose, herb, and heather gardens.

Taylor Memorial Arboretum

10 Ridley Dr. Garden City

Chester 19013 28 acres; daily daylight hours; heather, cotoneaster, boxwood.

John J. Tyler (Painter) Arboretum

515 Painter Rd., Box 216 1 ima 19060

711 acres; daily daylight hours. Open membership; special events. Large old specimen trees, rhododendrons, dogwoods, fragrant garden, conifers. Bulletin, quarterly.

Westtown School Arboretum

Westtown 19315

50 acres; open daily; conifers.

Ben Palmer, proprietor of Rose Valley Nurseries in Media, said he grows the red maple both at his nursery and on his own grounds. Palmer has exhibited at the Philadelphia Flower & Garden Show for 30 years. He has served on numerous Flower & Garden Show committees and has given invaluable help to the garden clubs exhibiting in the Show.

acer rubrum

If I had space for only one tree, *Acer rubrum* would be the one I'd plant because, to me, it has more good points than other trees. Our native swamp red maple is one of our best trees. It is attractive year-round; in winter its bark is a smooth grey; its interesting growth patterns and its red twigs are followed by early spring color, with masses of small red flowers, then small red-winged seeds. Many people welcome this process as the first real sign of spring.

Through the summer the red maple's medium sized green leaves provide helpful rather than overwhelming shade. Its moderate rate of growth and strong, well-shaped branching result in a solid and useful tree.

Its spectacular fall color, varying from light yellow to brilliant scarlet, with some trees turning color early and many others holding green for several more weeks before changing color, provides a long-lasting attraction.

Although this species is both common and plentiful, it is an excellent tree, both attractive and tough, hardy and resistant to insects and diseases, seldom requiring sprays or special attention.

The swamp red maple has a well-branched and bushy root system and transplants easily, either balled or bare root. It is readily available in most nurseries and is reasonably priced.

All of its forms are interesting and vary considerably in color and size. It is usually grown from seed. Several selections have proven to be of good and long-lasting bright fall foliage colors. 'October Glory' and 'Autumn Flame' are two varieties available, although scarce, in the Delaware Valley area. 'Armstrong' is a fine columnar form. These special types are propagated vegetatively by grafting.

Ben Palmer



Exacum affine is my favorite house plant. It is never spectacular but it does well and stays small in a 3" pot. In a bigger pot it makes a bigger plant but it is always compact, fragrant and easy to grow. It blooms continually for a whole year.

Technically, it is a biennial herb, a member of the gentian family, a native of Socotra Island. It has several common names: Arabian violet, German violet and Arabian gentian.

Plants can be grown from cuttings but seeds are easy. I sow mine in March or April for August or September bloom—but they can be sown anytime. The seedlings do grow faster in summer. Very soon they acquire their characteristic bushy structure with small shiny green leaves, and by the time they are 3" tall, they will start blooming. As they grow older they will be covered with tiny fragrant lavender stars. Cut off dead heads every couple of weeks to keep them looking neat.

Exacum plants are not fussy about soil but do best if it is humusy and well-drained. Do not overwater.

They prefer a 60° night temperature. They will grow in the greenhouse but do better still in a sunny window. After April 10 a little morning sun is best, but they will tolerate shade.

Their only pest seems to be white fly—easily controlled by spraying when the first one appears.

These plants are useful for fillers with more spectacular specimens or they are pretty alone or with a few ferns.

On sunny mornings in early winter when everything else is waiting for spring, exacum will reward you by filling the room with lavender fragrance.

Phyllis Williams



Phyllis Williams's scientific training as a biochemist at Radcliffe led her to explore horticulture more fully. She has studied at Longwood Gardens and the Ambler Campus of Temple University. Ms. Williams is a member of PHS Council.



Dr. Edgar T. Wherry is the country's foremost authority on ferns, phlox and wild-flowers. He has long been an advocate of the virtues of our native plants. PHS Library circulates 10 books written by Dr. Wherry. At present he is working on a study of the distribution of native plants in Pennsylvania, to be published by the Morris Arboretum.



George R. Clark is President of the PHS Council. He was an original member of the Lily Society when it was founded. Clark recently moved and is busily establishing a new garden.

silene wherryi

Probably everyone who takes up the study of wildflowers dreams of some day discovering a species new to science. Leave the "beaten track" and any observant person is likely to find new occurrences not only of rare but even of supposedly well-known species.

In the course of both official and vacation trips I became acquainted with the native plants of ever more distant regions and kept adding to my collection those whose habitats were not too dissimilar to make their successful culture unlikely. On May 15, 1923, I was guided by a friend to an undisturbed woodland near Lexington, Kentucky, and was intrigued by a bright pink silene, whose members are known as catchflies because of sticky coatings to which insects may adhere.

The bright pink silene was manifestly related to Silene caroliniana which grew around my home in Washington, D.C., and was represented in my garden there; but instead of the viscid calyx-hairs of the S. caroliniana, its calvx had a downy coating of fine glandless hairs, suggesting downy as an appropriate colloquial adjective. A specimen was sent to the New York Botanical Garden and named after me (Silene wherryi) by my friend Dr. John K. Small. * As "type specimen" he designated one from Alabama, differing only in having a pale pink corolla. Taxonomists who favor name-lumping later classed it as variety instead of a species, although it shows not the slightest intergradation with S. caroliniana, named by Michaux over a hundred years before. Whichever side of this quibble one favors. there is no question that it constitutes a useful addition to the growing list of American natives finding their way into rock gardens. Both deep and pale pink forms are now established in my Memorial Garden at the Barnes Arboretum.

At the original site in Kentucky as well as subsequently discovered stations in nearby Ohio, the downy catchfly grows in porous gravelly loam over limestone, the soil reaction being approximately neutral; in Alabama the rock is sandstone but the soil is similar. Both deep and pale color-forms have proved easy to grow in rock gardens and openwoods gardens, requiring only that the soil be as it is so often stated, "moist but well-drained."

Dealers prefer to carry plants from "far away places with strange sounding names," but are beginning to offer the glowing pink form (collected in Ohio); friends in Alabama are helping me get the charming pastel-pink form distributed. Propagation can be carried out by slicing the crown into pieces each having a fleshy taproot, although it is hoped before long to get seeds into the exchange of the American Rock Garden Society.

*Torreya 26:65, 1926.

Edgar T. Wherry

lilies

Some 25 years ago I stumbled onto an article in the Sunday *New York Times* by Alan and Esther MacNeil with illustrations from Mrs. J. Norman Henry's garden in Gladwyne, Pa. As she was an old friend of my family, I was emboldened to visit her wild gardens. I was first struck by the large clumps of superbums with their tall rich stalks, each with 20 or more blooms, but my fancy was really tickled by a bed of auratums with flowers as big as dinner plates perfuming the evening air. I was hooked on lilies.

I became intrigued by the many ways they can be vegetatively propagated. The stalks of those that form stem bulblets can literally be yanked, after blooming, from the bulb and inserted at a 45 degree angle in the ground. Another gentler and less frightening method is

to remove a few scales from a robust bulb. These are inserted in a polyethylene bag containing moist sphagnum moss and tied with an elastic band. Kept for 60 days in a warm, dry place such as a closed shelf, then placed for another 90 days into a refrigerator, these scales will form numerous tiny bulbs with roots along their margins. I plant them in a mixture of equal parts sterilized sifted earth, sand and peat.

Good drainage is absolutely essential to lily bulbs. When the growing area is low or water tends to accumulate, I raise the lily bed or area to be planted above the level of the surrounding ground. I dig a hole big enough to spread casually the three to six bulbs of a single variety that I generally plant in one spot. At the bottom of the hole, I loosen the soil, add some 0-20-20, mix it around and then place in the hole a one-inch layer of coarse sand. The bulbs, depending on their size, are planted six to 10 inches apart and covered with a mixture of sand, peat and sifted humus or earth. Where rodents are a threat, and they love lily bulbs, I add to this covering a substantial amount of crushed road stone.

If you cut two and three stalks of lilies, leaving at least half of the stem to nourish the bulb, arrange them in a spacious vase, they can last a fortnight in water. These graceful blooms will perfume the house and make you proud that you took the time to plant them properly.

George R. Clark



LET YOUR HORTICULTURAL INTERESTS GROW at the PHILADELPHIA FLOWER AND GARDEN SHOW

March 11 - 18 Philadelphia Civic Center

Hundreds of horticultural specimens grown by your friends and neighbors.



An unheated lath house covered with plastic generates enough heat to force the forsythia, boxwood, rhododendron and spyrea for the Show. Plants are stored here until moved into the greenhouse. See story beginning on page 2.

photo by Edmund B. Gilchrist

green Scene

MAY • JUNE • 1973

HORTICULTURE IN THE DELAWARE VALLEY















green scene

HORTICULTURE IN THE DELAWARE VALLEY

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Front June Vail explores Webb's Mill Swamp in Cover: the Pine Barrens with young man who is part of PHS tour.



the djinn of the garden

The cure for this ill is not to sit still,
Or frowst with a book by the fire;
But to take a large hoe and a shovel also,
And dig till you gently perspire;

And then you will find that the sun and the wind,
And the Djinn of the Garden too,
Have lifted the hump—
The horrible hump—
The hump that is black and blue!

Just So Stories, Rudyard Kipling

Those of us who in our childhood were well exposed to Kipling's Just So Stories will remember that the hump the Djinn of the Garden lifted was "the hump we get from having too little to do." Its symptoms were all-too reminiscent of the condition the sociologist calls alienation, but Kipling described it better. "We climb out of bed with a frouzly head/And a snarly-yarly voice./We shiver and scowl and we grunt and we growl/At our bath and our boots and our toys."

Every gardener knows that there is a Djinn of the Garden who can banish boredom and depression and summon in their stead concentration, satisfaction and pride in a job well done, and a sense of physical well being.

And every gardener knows, too, that the Djinn does, indeed, accomplish his results through gentle perspiration. Gardening is work, mental and physical. A gardener must read and observe and think. And then he or she must do. Vita Sackville-West, who wrote as well about the joy of gardening as anyone, said that amateurs are inclined to stick in a plant "all anyhow" and leave it to take its chances. She insists, "Good gardeners, the gardeners who know their job, take far more trouble."

The point, of course, is that the joy of gardening lies in taking the trouble to do it right. No matter what a lot of the popular literature may say, there are no good all-purpose gadgets, no miracle fertilizers, no "everblooming" plants. And there is no such thing as a garden that requires no care, and if there were, it would be no fun at all.

It is precisely because gardening is difficult and exacting, and at times tedious, that it is also rewarding. Those who take the time and trouble to do it well will find that the Djinn of the Garden is still very much in evidence.

Ernesta D. Ballard

EXPLORING THE UNIQUE PINE BARRENS OF NEW JERSEY



by June Vail

June M. Vail graduated from the Pennsylvania School of Horticulture for Women (now Ambler Campus of Temple University). She worked for some time in Whitesbog, New Jersey in the Pine Barrens, in the selection of varieties of blueberries and holly. She was staff horticulturist for PHS and is still active as a consultant and a leader of trips to the Pine Barrens.

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Hair cap moss (Polytricum commune)

At far right, moving in for a closer view of pyxie moss (Pyxiedanthera barbulata) and some lichens.

If you go on a bright sunny day to the heart of South Central New Jersey, just a few feet away from the busy highways, you will find a world of unique plants. That world is about 30 miles wide and 80 miles long and comprises one of three places on the eastern American Continent where several unusual plants can still be found. Among these plants are corema (Corema conradi), curly-grass fern (Schizaea pusilla), golden club (Orontium aquaticum), golden-crest (Lophiola americana), leather-leaf (Chamaedaphne calyculata), pyxie moss (Pyxidanthera barbulata), orange milkwort (Polygala lutea), sandmyrtle (Leiophyllum buxifolium) and sweet pepperbush (Clethra alnifolia). If you stay on any one of several welltraveled gravel roads, you will easily find many of these plants. Low wet areas may have one group of plants, higher ground another.

How long these areas will remain, one can only guess. The encroachment of new developments destroys the habitat for rare vegetation. At present, developers who own several hundred acres at the edge of this unique land are trying to change zoning laws in order to establish a new town.

In the Pine Barrens many ghost towns silently persist where industry did thrive for a short while. Lack of transportation to the somewhat remote area worked together with diminished raw materials to defeat the glass manufacturing, iron, brick and charcoal towns. Many locations are just a name with foundations of buildings marked only by plants that are not native to the area, but which grow because of the lime in the old foundations. Among these are asplenium fern (Asplenium platyneuron), flowering quince (Chaenomeles japonica), lilac (Syringa vulgaris), yucca (Yucca

filamentosa), or a group of catalpa trees that mark the spot of an earlier home that is now gone.

Bearberry (Arctostaphylos uvaursi) is found on high ground, covering considerable areas with a network of green runners. Its small upright branches or long runners are covered with little leathery leaves, bright green in summer, red brown in winter; in spring they are decked with tiny, inverted, pearly, pink-tipped urns, and later with green then red berries. The leaves contain tannic acid and were used medicinally by the natives, the families that have lived there for generations. The roots have been found growing 20 feet deep on railroad banks where they have had to go down for water. The mats of bearberry nurse many other plants of briefer beauty, such as yellow asters (Chrysopsis mariana), purple asters (Aster linariifolius) and white asters (Aster simplex), the fall flowering goldenrods (Solidago spp.), and purple wands of gayfeather (Liatris spp.) which open their flowers from the top down.

High on the sandy edges of the road or in the open fields or woods where light can reach the ground readily, heath-like hudsonia (Hudsonia ericoides) will abound. This bright yellow flowering low shrub is one of the heralds of spring. It wears a red brown coat all winter and then turns a bright green before putting on its dazzling yellow dress for the early suns of spring.

The high oak trees shelter the polytrichum or hair-cap mosses. The plant is one of the most common and versatile of the Pine Barrens. It grows on high sandy ridges and all the way down to the very wet soil. In many areas it will nurse other plants by holding rain water near the soil's surface so that seed of other plants

continued



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caught in it can germinate and grow. Every plant within the boundary of the Pine Barrens has a given range of water tolerance. If the seed falls above or below this range it will not grow until the correct amount of water is available. Other factors necessary to stimulate germination are maturity, heat and light. Not all seed mature the year they are formed. They do not all develop at the same rate; some may take several years before the right combination of conditions produce growth. This selective germination is nature's way of providing over a wide range of weather conditions.

On the higher ridges of the low scrub oak and pine plains where the vegetation does not reach much more than 6 feet high, the Conrad's crowberry (Corema conradi) is found. Corema, with its minute bright green leaves that form right angles to the wiry woody stems they are attached to, is the first to show that spring is

really here. The anthers, either in a purple or red-brown dress, are the only part of the flower to be seen. The anthers are followed by a green then black berry from which the plant gets its common name, crowberry. The

At present, developers . . . are trying to change zoning laws in order to establish a new town.

corema is one of the unique plants of the Pine Barrens. Periodic fires from lightning or sun on discarded glass is slowly reducing the number of these plants in the plains of the Pine Barrens.

Trailing arbutus (Epigaea repens) is found on a slope exposed to the northeast, sheltered from the bright heat of the summer sun. The dainty white through pale pink buds part to show the soft fuzz of the inner flower; it has a memorable delicate fragrance that fills the air on a warm day in May. If

you know where to look it can still be found on the plains under the shelter of a spreading pine or oak where the water table is high enough to meet its needs. The rough oval leaves on the prostrate trailing, shrubby plant are quite unexpected with such a fragrant flower. Perhaps it was its leaves that suggested the name gravel plant. It too was used by the natives medicinally, sometimes as a substitute for bearberry or uva-ursi as it was called.

The horsemint or *Monarda punctata* is quite a spectacular plant when found in large numbers. This perennial plant of the mint family grows two to three feet tall and has pale yellow through bright pink-purple bracts spreading like a hat in tiers over the red spotted yellowish flowers. The natives dried leaves to make an aromatic, pungent but bitter tea used for colic. It grows in open fields or along the railroad where the drainage is good.

The moccasin flower, pink lady's continued



Member of PHS tour to Pine Barrens examines sweet pepperbush seed pod under hand lens.



slipper or *Cypripedium acaule*, is named for the shape of the flower. It prefers open woods with a heavy pine needle mulch that will not freeze for very long periods at a time in the winter. It will come as a surprise to find these on a warm day in early May. The pale through deep pink oval shaped flower has purplish veins with the upper inside surface showing long white hairs.

Orange milkwort is a biennial; it spreads its pale green winter rosettes in moist open spots. The brilliant orange flower seems to compete with the sun as each floret opens on the compact flower head to complete its mission, then drops cleanly, still perfectly fresh and unfaded, holding closely in its fleshy substance two tiny black seeds. When the first seed drop, the flower head may be nearly an inch long and three-fourths of an inch in diameter, the top coming to a point of wee buds. Thus each flower head will last in perfectly fresh condition for many weeks. It is only by the length of a minutely indented stem, often more than an inch. between the flower head and the six to 10 inches of smooth stem below that one can guess approximately how long any particular head has displayed its vivid flowers. The seed will complete their maturity on the ground and start a new rosette to winter over if weather conditions are right. It is another of the unusual plants to inhabit that section of New Jersey.

Pyxie-moss is another plant indigenous to the low wet areas. Its habit of moss-like growth has won that name for it. It is a thrill to find the low woody plant with its sharp pointed leaflets forming a tight rosette that in early spring holds in its center a pearl white bud bursting open to a lovely white star. A mature plant may in time cover several square feet, encircling other plants as it grows.

The real nurse plant of the Pine Barrens is the sphagnum moss. Several varieties of sphagnum can be found in the bogs. It is still collected by a few natives or Pineys as they are called, and sold on the commercial market. When it rains, the moss soaks up water like a sponge; and like a sponge the water can be squeezed out of it. Sphagnum nurtures many kinds of

plants that require high moisture to grow. The sundews (droseras), pitcher plants (sarracenias) and cranberry (Vaccinium macrocarpon) along with bladderwort, golden-crest and curlygrass fern are found where sphagnum moss grows in abundance. Many of the orchids will also grow here on the hummocks of the open glades or on the higher edges. There is one place in particular where all of these things grow in easy view of a busy highway. Unfortunately, it has been too easy for people to go in and remove many of the small dwarf white swamp cedars (Chamaecvparis thyoides) that had been there for more than a hundred years. Why people who love plants will continually remove these small plants from their native habitat, which is often very hard to duplicate, is more than I can understand.

Chamaedaphne calyculata is known by several names. To a cranberry grower it is called indicator bush because wherever it grows cranberries also grow well. Because it turns from a summer green to a leather brown through winter, it is also called leather

Chamaedaphne calyculata is also called the indicator plant because wherever it grows, cranberries also grow well.

leaf. The same leaves turn bright green again in the spring. Its arched wire-like stems produce a row of speckled tight brown buds in fall that burst into white inverted urn shaped flowers in mid-spring. The flowers hang from the underside of the branch like soldiers in a row.

The curly-grass fern is on its southern limit here in New Jersey. In the northern coastal location it grows in abundance but here there are only a few plants within easy reach of the highway. Unless you know what to look for it can easily be overlooked. The overall height is only about two inches with the thin green wire watch spring-like leaves very close to the ground in a tiny mat of growth.

The cranberry bogs are located along the head waters of the main streams because the organic matter is deeper and the water can be dammed to form reservoirs for a constant supply of water during the growing season. The cranberry vine has shallow rooting and is covered with water throughout the winter to keep it from freezing dry. The cedar swamps are at the head of the streams; the decomposing leaves accumulated at the base of the trees eventually turn the water that flows through tea brown. Most of the cedar left in the Pine Barrens is secondary growth. The large trees have been lumbered off for the saw mills or destroyed by fire. Pine (Pinus rigida) and oak (Quercus marilandica) in the Barrens will come back quickly after fire but cedar is killed outright and must start again from seed.

The culture for the production of cranberries started around 1857 and blueberries (Vaccinium corvmbosum) around 1911 with holly (Ilex opaca) following about 1930. All three are large commercial crops in New Jersey today. The Indians harvested the native plants before the settlers came. The dates given above are for commercial growing which changed the culture from the haphazard picking of wild plants to the selection of outstanding varieties for marketing. Many people still like the wild fruit of the blueberries because they are a mixture of flavor and aroma, sweet and tart. The commercial fruit is all one variety, which does not appeal to everyone in the same way. In the early days of cultivated blueberries many people automatically called them huckleberries (Gaylussacia frondosa) not realizing there was a great difference between the two. A blueberry may have as many as 150 seed to the berry; yet they are hardly noticed when the berry is eaten. The huckleberry on the other hand has only 13 seeds which are very noticeable when the fruit is eaten.

One of the last showy plants to come in bloom at the end of the growing season is the Pine Barren gentian (Gentiana autumnalis). It is a new thrill everytime I see one. The bright deep blue of the wide open flower on a sunny day is beautiful.

If you have an interest in unusual plants, take a trip through the unique Pine Barrens of New Jersey someday and be sure to stop along the road to see the plants that grow there.



At right, Pine Barren gentian (Gentiana autumnalis)

Below right, Pitcher-plant (Sarracenia pupurea)

Below, Horsemint (Monarda punctata)





the green scene • may 1973



Twenty years ago I wrote: "One of the loveliest gardens I ever saw was that of a country woman who lived on a back dirt road in a small house with no conveniences. She kept a couple of goats for milk and an old horse. Whenever we went there the yard was a mass of flowers. When the pinks were in bloom you thought she had nothing else, but when you went later her phlox was blooming all over the yard. Still later prize-winning dahlias made a great splash of color. She used to throw her soapy dish water out on her flowers, and she fertilized with the manure from her animals. The rest, I think, was just a matter of not being too neat in her garden. Her pinks and sweet williams, phlox and other

flowers had self-sown all over and she had not weeded them out.

"I was looking over my garden this morning, and I wondered what plants I would have if I had to do a minimum of gardening. There would be two kinds of plants: those that are fairly permanent and those that seed themselves. First, there would be lots of hepaticas and bloodroot in all the shady parts. There would be Johnnyjump-ups all over the place. The blue flax and lavender woods phlox would have sown themselves everywhere. Pinks would be coming up all over, so would violets like the lovely longspurred Viola rostrata and saponaria, which makes pink sheets, and the alpine forget-me-nots and white cerastium. Then there would be great mats of mountain pink, thyme and creeping veronica, clumps of daylily and dwarf iris of many sorts, sheets of lily-of-the-valley, the wild red columbine in sun and shade, sempervivum and the nicer sedum everywhere. Lavender and sage would make shrubby masses and primrose would be all through the shady spots. It is a comforting thought that when I grow too old to garden much—I will still have flowers!"

And so twenty years later it has come to pass. My garden has gone through several stages since then. For years it was a rock garden nursery, the plants kept divided or raised from seed in salable clumps, the spreaders kept



under control. Then, when I gave up the nursery, it became a rock garden of rare plants raised from seed—saxifrages, lewisias, summer and fall blooming gentians, the early androsaces followed by aethionema (Persian candytuft) and innumerable others. The woodland path was kept full of primroses including the *Primula veris*, a form of the native cowslip, bulbs and the good native woodland wild flowers and ferns. Each year some bulbs were added in both sun and shade.

Gradually the garden changed character and I felt it was no longer a rock garden (though the rocks are still there!) but a wild garden. I had been letting the spreaders spread (not the weedy white cerastium), semper-

vivums were covering a large rock, and there were mats of thyme and sedum, and lily-of-the-valley-which luckily prefer shade. Creeping phlox was there in fascinating variety and the harsher ones were discarded. But all seedlings were allowed to develop to see what interesting form or color they might take. Pinks in their season really were all over the place, the mediocre were pulled out, but the good ones were allowed to seed. Phlox divaricata, the woodland phlox, spread its lavender flowers through the woods and any half-shady parts of the hill garden. So did the wild columbine as well as many others of its ilk originally raised from seed. The long-blooming true geraniums made bushy mats of

the delicious pink *G. lancastriense* or the more brilliant *G. sanguineum*, while the dwarf *G. dalmaticum* with silky pink flowers added its dainty charm. Wild geraniums, both the big pink and the little Herb Robert, came up in half-shade where permitted. Violets ran riot.

The hill garden in the sun became a mountain meadow. In June and July it will be yellow with potentillas of many kinds, including the shrubby ones, evening primroses and spreading brooms. A pleasing contrast will be the blue platycodon in a compact form, raised from seed in the past, making good patches of their blue balloon buds and big open-cupped flowers and seeding themselves around. continued



At the top of the hill where I had put a few tall perennial phlox for August color, they have made themselves very much at home and I look forward to the thrill of a mass of color in their season. Contrary to the prevailing idea that phlox, if not kept cut back, will revert to type (the rather harsh original purplish pink) they have hybridized into a wide assortment of pale to deep warm pink to red—white, with or without a contrasting eye, and other combinations, some of them tall, a few dwarf.

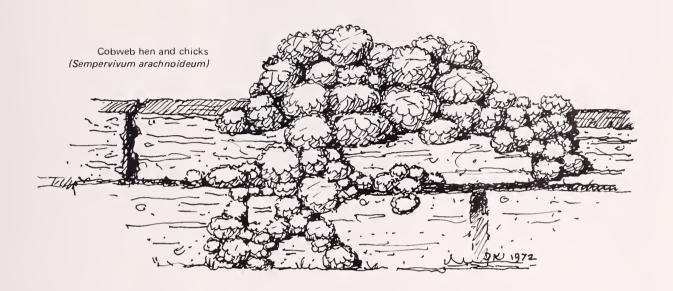
Long ago, from our friend Claude Barr in South Dakota, I received plants or seeds of the dwarf *Tradescantia* bracteata or day flower, which blooms in May and early June. When I had the

nursery, I remember writing Mr. Barr that it was a weed here, for it spread by underground roots as well as by seeding, and though the colors of the flowers were delightful, they had a way of appearing in the middle of nursery clumps of other plants. Now they spread all they want to-the colors are ravishing: pinks and whites, purples and soft blues in many different shades. They disappear after blooming so are not really a pest, like their compatriot, the poppy mallow (Callirhoe involucrata) is inclined to be. All through June, July and August one is grateful for the silky red cups of the mallow-but it does need controlling.

The weeds keep growing, of course,

but when the flowers are in bloom no one notices the weeds, for the garden looks gay and natural. A very thorough cleaning up last fall and another very early this spring started things off satisfactorily, but I know that during the heat and bugs of summer it will probably be neglected and the weeds will no doubt get out of bounds. However, I know, too, when the weather becomes more moderate and the bugs are quiescent, a couple of weeks of concentrated work will suffice to bring the garden back to normal and that the flowers will persist.

A thousand years ago my heart doctor said to me "never give up your gardening." I have obeyed him—but best of all, my garden has never given me up.



Doretta Klaber was nominated by the American Rock Garden Society to receive the 1971 Pennsylvania Horticultural Society Annual Plant Society Award. Ms. Klaber was unable to be present to receive the award but she sent instead a message. We believe her message so beautifully exemplifies the development of a true horticulturist that we are printing it with a few minor deletions in place of the usual biography.

"It makes me very happy to know that all the things that I like best to do—growing plants, writing about them and drawing their portraits—have found a warm response among so many other gardeners and growers and those who really see the beauty of the world about us. To me it seems only natural to want to bear witness to something I

feel so deeply.

"I have lived a long time—it will soon be 84 years—and my mental scrapbook goes back at least 80 of those years. I see a little girl of four looking at a yellow lady-slipper that she may smell but mustn't pick; at six she is filled with joy at the sight and smell of a border of white narcissi and sweet violets. A bit later she stands entranced on first seeing a shining laurel bush covered with its odd pink flowers. Much later it is the Muir Woods that hush and enthrall her-the outdoor cathedral of giant redwoods with the sun slanting through them and tiny quiet people grouped below.

"We were city children but fortunate to spend our summers in the hills and mountains and there a favorite picture is of lovely shaded brooks with mossy rills and ferns and quiet beauty.

"In my youth I went to art school—later did social work and secretarial. Next, I married an architect, Eugene Henry Klaber, and had two children and while they were still young studied landscape work and practiced garden design for many years. After that I ran a rock garden nursery for 18 years, but it wasn't until I was over 70 that the urge to share what I had learned and what I loved so much came forth in the form of books on plants—my fourth* supposed to be out this fall..."

^{*}Ed. Note: All but the last of Ms. Klaber's books are available through the PHS Library. Violets of the United States, the fourth book, is now promised by the A. S. Barnes Co. late this spring.

sand

Q. Gardening articles always recommend using a sharp sand—a "builder's" sand. I am interested in finding a good type of sand to use in working the soil before planting heathers. But I am also interested in a good sand for general use.

The garden center nearby suggested playpen sand. The quarry nearby sold me a builder's sand that was brown and made nice cement. At another quarry I found something I like but am not sure of how it would affect the soil. It is washed limestone sand (limestone ground to the size of the top of a pin, I would say). I also got some of ¼" size, which would be good on the bottom of pots for drainage.

One person said it would make the soil more alkaline. Another said limestone and lime are different. The limestone plus water would be a form of carbolic acid and make it more acid. Would it hurt to use this wonderful, gritty, clean sand and stone? I like it better than perlite and it certainly is less expensive.

I would appreciate your help on this for I haven't come up with the answer around here. I wish I had taken more chemistry in school.

E.K., Camp Hill, Pa.

A. You certainly have been given a great deal of conflicting information. I do not agree with your nearby garden center that you should use a playpen sand. Usually this sand, which is sold for sandboxes or playpens for children, is extremely fine and very similar in texture to seashore sand and compacts very easily. The person who told you to use builder's sand was correct; we use a coarse brown or tan colored builder's sand and find it very satisfactory. By all means do not use the limestone sand since limestone and lime are one and the same thing. Ground limestone is the type of lime that should be applied to lawns and beds if you wish to make the soil more alkaline. Since you are interested in raising heaths and heathers and these plants require a very acid soil, you would be defeating your purpose by adding any kind of lime whatsoever.



by Ed Lindemann, horticulturist

digging for information

HORTICULTURAL CORRESPONDENCE

propagation

Q. Can you tell me how I can start new plants? The two that I would most like to propagate are my Boston fern and a *Philodendron selloum*. I understand the Boston fern can be divided but I don't know when to do this. Also can the philodendron be rooted in water?

L.N., Philadelphia, Pa.

A. Your Boston fern (Nephrolepsis exaltata bostoniensis) puts out runners in great profusion. New plants form at the end of these runners when they come into contact with soil or any wet surface. The plant can also be propagated by division; that is, you can divide the plant in half, being sure to include the roots. As soon as you've made the divisions, repot them before they have a chance to dry. The pot should be just large enough to easily contain the roots without crowding. If the plants appear

to be top-heavy, trim some of the oldest and largest leaves back. Be especially careful not to allow the newly potted divisions to dry out.

Philodendron selloum is one of the cut-leaved self-heading varieties. These plants should only be repotted when the roots have completely filled the pot and begin to emerge through the drainage hole in the bottom. Self-heading philodendron such as yours are propagated by offsets (new shoots). These offsets usually do not appear until the plant is quite mature. Examine the base of your plant to see whether or not any new shoots are coming up. If you do see offsets repot them into a general potting soil and keep them in relatively high humidity and a warm temperature of 70-80 degrees. The high humidity and warm temperature will help to encourage the rooting of the new plants.

dizygotheca elegantissima

Q. Could you possibly let me know what is happening to my plant. In about six weeks' time the plant, which stood almost 3' tall and about 2½' around, has deteriorated: one stalk is completely bare, a second has just three top leaves and the third has only half its leaves.

Very tiny sprouts still keep coming at the very top from about three leaves, but the remainder of the foliage looks like the enclosed sample. A dark brown sheen appears, and then whole clumps of the spiny leaves just fall off. Lately, down the center or spine of the leaves, there appear white flecks that look almost like nits.

E.C., Philadelphia, Pa.

A. The plant is *Dizygotheca elegantissima* commonly called finger aralia. This particular plant is rather difficult to keep as a house plant. When it does not receive enough light or humidity it loses its leaves, particularly the lower ones. Once these leaves have dropped, there is nothing you can do but cut back the plant and wait for new growth.

Your plant shows signs of a heavy scale infestation. I suggest you spray it with malathion following the directions on the bottle.

mealy bug

Q. I recently acquired a large collection of cacti. Several of the plants seem to have a disease. They are covered with small, white, fuzzy, sticky spots; I guess it is a mold or fungus. What can I do to get rid of the problem? Will the disease hurt the cacti?

F.M.V., Broomall, Pa.

A. From your description of the problem, I am sure your cacti are suffering from mealy bugs. These sucking insects are probably the worst pests of cacti. They extract juice from the plants and cause extensive yellowing and an overall sickly looking condition. If the number of mealy bugs present is not too great, they can be removed with a small brush. Malathion spray may be used against mealy bug infestations of cacti;

however, a few species of cacti are sensitive to this substance. To be sure that you will not damage your cactus, try it on a small area of the plants first.

cineria

Q. I received a lovely cineria plant as a gift. I have only had the plant a few days and already it is starting to look poorly. The flowers are fading and the leaves are curling. How can I keep the plant flowering and also restore it to good health? What is the disease that is causing the leaves to curl?

H.G., Philadelphia, Pa.

A. Your letter and the enclosed plant specimen from your cineria arrived in the mail and I could find no disease symptoms. Your problem might be temperature. A cineria will bloom well only at low temperatures, usually around 60 degrees F; even at that temperature the flowers should not be expected to last more than two weeks. Also your plant was probably forced in a greenhouse where the humidity was much higher than it is in your home; the lower humidity is probably causing the leaves to curl.

CORRECTION

It has been called to our attention that the photograph of *Narcissus cyclamineus* on page 15 of *The Green Scene* (March, April) should have been identified as a hybrid. The original labeling was as we printed it; on further checking we found it was a *cyclamineus* hybrid but since the plant is no longer available it could not be positively identified.

classified ads

FOR SALE: Ernesta D. Ballard's *Garden in Your House*; 2nd ed. (\$6.95) at LAURIE TODD'S Bookshop for Gardeners, 8 E. Baltimore Ave., Lansdowne, 284-3262.

FOR SALE: Bebe Miles' Bluebells and Bittersweet (\$7.95) at LAURIE TODD'S Bookshop for Gardeners, 8 E. Baltimore Ave., Lansdowne, 284-3262.

FOR SALE: Pressed flower gift cards and pressed flower pictures at LAURIE TODD'S Bookshop for Gardeners, 8 E. Baltimore Ave., Lansdowne, 284-3262.

FOR SALE: William Rolfe Creations—treasured works of art—real flowers preserved forever in clear lucite. Heirloom pieces at LAURIE TODD'S Bookshop for Gardeners, 8 E. Baltimore Ave., Lansdowne, 284-3262.

TERRARIUM PLANTS and supplies, kitchen HERBS and some unusual perennials. See our antiques, reproductions and gifts. Come browse—it's FUN!—The Country Cupboard, Routes 202 and 263, Buckingham, Pa. Phone 794-8645.

Newly published reprint of Witmer Stone's classic 950-page hard-bound book on the plants of the Jersey Pine Barrens: *The Plants of Southern New Jersey*. \$25.00 POSTPAID. Quarterman Publications, 5 South Union St., Lawrence, Mass. 01845.

May 23, 24, 25 — 9:00 a.m. to 9:00 p.m. Enhance your summer garden; traditional and contemporary garden containers and ornaments FOR SALE at Millcreek Mercantile, 861 Lancaster Avenue, Bryn Mawr, Pa. Charlotte Archer and A. Scott Williams.

Polly Fairman's Indoor Bonsai and Japanese Gardens, 103 Mt. Lucas Road, Princeton, New Jersey 08540. By appointment. 609-924-3202. Indoor Bonsai. Gifts for plant loving friends and relatives. Supplies, planters. Saturday morning clinics for all Bonsai problems. Japanese landscaping. Lectures for garden clubs.

Alpine and Rock Garden Plants - Troughs - Greenwood Farms Nurseries, 1421 Ship Rd., West Chester, Pa. 19380. Call for appointment 215-696-8020.

Trade or buy named daffodil bulbs registered prior to 1923. Reply to Box 1-NT, c/o PHS.

FOR SALE: Large variety of unusual and rare plants for house or greenhouse. Call TU 4-0497

Young couple (PHS staff) looking for Carriage House or Garage Apartment within city limits. Rent or buy. Call WA 2-4801 from 9 until 5.

Enjoy your gardening a little more this year. Let us help you with your gardening chores. Experience and care will go into handling all phases of gardening. Indoor plant maintenance for vacationers. Call Living Green, VI 9-4073 or VI 9-8856.

AFRICAN VIOLETS. African Violet color catalog send 20¢. Greenhouses open daily and Sunday afternoon. We carry full line violet accessories, pots, violet jars, terrariums, fluorescent lighting equipment. TINARI GREENHOUSES, 2325 Valley Road, Box 190, Huntingdon Valley, PA 19006.

BONSAI AND SAIKEI CLASSES. Beginning and advanced techniques. Also indoor bonsai and rock plantings. Our ninth consecutive year—1973 schedule available. Dorothy S. Young, Keith Valley Nursery, McKean Road, Spring House, Pa. 19477. Telephone (215) MI 6-8915.

Advertising copy should be submitted 8 weeks before issue date: November, January, March, May, July, September. Minimum rate \$5.50 (covers up to 35 words). Additional words 20¢ each. Less 10% discount for two or more consecutive issues, using same copy. All copy should be accompanied by check made out to PENNSYLVANIA HORTICULTURAL SOCIETY and sent to Patricia M. Cain, THE GREEN SCENE, 325 Walnut Street, Philadelphia, PA 19106.

BIENNIALS:

plants for the gardener who's not afraid to work



by Martha Ludes Garra

The gardens of many PHS members were gay with masses of well grown Canterbury bells and sweet william; stately foxglove stood tall in the backs of herbaceous borders; while delicate Iceland poppies sat in the front rowsall 50 years ago in June. What would you find in June '73 in the members' gardens? Not too many of these old favorites, I am afraid, for growing biennials is becoming a lost art.

The disappearance of biennials is partly due to the mistaken idea that they are difficult to grow or too much trouble. People also feel that, except for pansies, biennials do not flower long enough. While the biennials cannot match the annuals for length of bloom, they can hold their own with many perennials. A well grown group of sweet william will give you several more weeks of bloom than German iris in a group of equal size.

Because biennials are grown on in another part of the garden (or purchased) and set into place shortly before they bloom, and because they will occupy that place for only a few weeks you can afford to plant them quite closely. They will create a smashing effect while in bloom, and when their show is over, they are expendable. When they are removed their space can be filled with annuals for summer bloom or, if you go away during July and August, you can set out well pinched chrysanthemum plants for bloom when you return. This garden technique is called succession planting and insures maximum use of space in the borders. I reserve approximately onethird of the space in my herbaceous borders for succession plantings.

Biennials need not be limited to the flower garden. Pots of pansies are frequently placed on terraces or garden steps but I would recommend also potting up a few plants of Canterbury bells or foxgloves and grouping them for color accents and form on a terrace. Grow a few extra plants for cutting, as well. You would hesitate to cut any from the flower borders but in the picking garden you could cut every one, and with long stems too, for handsome arrangements in the house.

Most of the biennials discussed here are among the oldest of cultivated plants. Evidently gardeners in other periods of time did not consider growing biennials to be too much trouble.

Botanically speaking, a biennial is a herbaceous plant that completes its life cycle in two years. Seed is planted one year; vegetative growth develops and lives over the winter; the plant blooms the following year after which it sets seed and dies. From a gardener's point of view, however, the term is used quite loosely to cover all the plants that are treated as though they were true biennials and these include some annuals and perennials. I have taken that liberty in this article.

I would recommend also potting up a few plants of Canterbury bells or foxgloves and grouping them for color accents and form on a terrace.

Biennial plants, with a few exceptions, are not readily available in any quantity from local sources. Do not blame the growers for this. If the demand were there they would be happy to supply them. (See editor's note on M. Horner's article in the Growing Interests section in this issue.)

The best way to get exactly what you want in color and variety is to grow your own from seed. Many of the English garden books advise planting the seed of biennials in May or June, but they do not have to cope with our hot summers. Mid-July would be the very earliest for sowing seeds of Canterbury bells, sweet william or foxglove and most of the others would benefit from a later sowing in August or even September.

Years ago a pansy grower in Oregon sent out cultural directions with his seed. He pointed out that market gardeners had to sow their seed early so that they would have very large plants (the kind the general public expects) at the earliest possible date in the spring. Home gardeners, on the other hand, could manage their plants quite differently and for them he advised planting seeds in September. I tried it; found he was right; and never went back to the early planting. We do have wonderful growing weather into November and, with the protection of a cold frame, the plants will be very compact and sturdy before really cold weather comes. They will be ready to start off with a bang at the first sign of spring warmth. It sometimes happens that we get days and days of rain just when you are ready to set them out. Don't worry, even if you cannot tell them to slow down or stop growing, they will not get too leggy while you wait for better planting weather.

I sow the seeds in clay pans using good garden soil which I lighten with sand and sifted compost. I fill the pans to within 1/2 inch of the rim and then place a layer of milled sphagnum on top. The seeds are sown directly on the sphagnum and if they are fine are just pressed in. For the larger seeds I rub the sphagnum through a sieve and sift lightly over the top. The pans are then labeled and set in a larger pan of water until the soil and sphagnum is thoroughly wet. I drain them and then shade them until germination begins. The sphagnum is moistened with a mist spray when needed. If you do not have a cold frame, the instructions for making an inexpensive, durable substitute are available on request from The Green Scene.

When the seedlings are big enough to handle I prick them out into flats photos by the author

Martha Ludes Garra has been a horticultural consultant for many years. She frequently lectures and has given clinic programs at PHS. At present she plans the plantings in the Society's 18th century garden. Ms. Garra has planned and conducted six garden tours for the Society.

At right, Canterbury bells (Campanula medium)

and from the flats they go into the cold frames. I use a light dressing of high analysis fertilizer (20-20-20) in preparing the soil in the cold frames, and I always work in a generous amount of compost. I do not put the sash on the frames until the night temperatures begin to drop, but I am careful to ventilate them all through the winter whenever the weather conditions require it.

biennials worth growing

Viola tricolor - pansy. One of the most beloved of spring flowers, it is available in a bewildering array of colors. A continuous breeding program has produced ever larger flowers and many forms from flat discs to very ruffled ones. Available in solid colors as well as with dark blotches and veins that produce the so-called pansy faces.

Bellis perennis - English daisy. This is the true daisy; its wild, single form is a pest in English lawns. The garden forms are double and come in white, pink or rose-red. Their neat, compact growth and 6-inch height make them ideal for edging or as a ground cover under bulbs in May.

Myosotis alpestris - forget-me-not. Minute flowers are so closely set as to give a solid color effect in blue, pink or white on plants 6 inches to 9 inches tall. The blue one is especially useful because there are so few blue flowers for the early spring garden.

Campanula medium - Canterbury bells. The common name describes the flowers that are borne in profusion on plants about 30 inches tall in June. There are single, double and cup-and-saucer forms and the colors are white, pink, rose, mauve and dark blue. This year an English firm lists a dwarf form called 'Musical Bells' which is 18 inches high.

Digitalis purpurea - foxglove. "The Foxgloves are old-fashioned and dignified, clean of growth and wholesome company in the choicest gardens." That description in my 1914 edition of





Iceland poppy (Papaver nudicaule)

Bailey's Standard Cyclopedia has always delighted me. Apparently, the plant was more appreciated years ago than it is today. The flowers are elongated, flaring bells, usually with spotted throats on 3-foot to 5-foot stalks. 'Primrose' and 'Apricot' are beautiful older varieties while the 'Excelsior' strain is a fine newer development. They bloom in late May and June.

Dianthus barbatus - sweet william. The fragrant flowers develop in broad, flat clusters on the top of 18-inch to 24-inch stems. They may be single or double and the colors are white through shades of pink to dark red as well as the two-toned auricula-eyed forms. The very dark red 'Nigricans' is beautiful combined with pale blue, pale yellow or any of the pink shades of companion flowers in the border in June.

Years ago I grew Sutton's 'Fairy,' a beautiful apple-blossom pink variety. It has been unavailable now for a long time; I've been promising myself that one day I will sow a packet of mixed pink shades in the hope of finding my lost 'Fairy.' If I am lucky, I can then propagate her from cuttings.

Papaver nudicaule - Iceland poppy.

Long overlooked in gardens, the Iceland poppy seems to be staging a comeback, perhaps because we have learned that it is best treated as a biennial. It is 18 inches tall with graceful, nodding buds opening to fragile, tissue thin, crinkled petals in glorious colors from white through yellow to tangerine and orange and through all the shades of pink to deep cherry. It blooms from May to July.

Cheiranthus cheiri - wallflower. Beloved of English gardeners in springtime, the four-petaled, fragrant flowers are borne on erect stems from 9 inches to 2 feet. My favorite English catalog lists 25 named varieties in colors from creamy white through various shades of yellow and orange to brown as well as pastels, rose-pink, ruby-velvet, red and crimson.

Althaea rosea - hollyhock. Missing from our gardens for many years because of the serious rust disease that attacked it, it has been making a comeback since rust-resistant varieties have been developed. Blooming in June and July the stately flower spikes are 5 inches to 7 inches tall. There are single, semi-double and double forms in al-

most all colors except blue.

Hesperis matronalis - sweet rocket. Sweet rocket has escaped from gardens and can now be found occasionally growing in meadows or beside streams. I consider the tall white one worth growing in the border. I admired the double dwarf white form when I saw it growing at Annes Grove in Ireland; Mr. Annesley offered to take cuttings and have a few plants ready for me when I returned the following year with the PHS tour. I had to refuse, explaining sadly that I would not be permitted to take them through customs. Being able to grow the rare double form of the tall white rocket was once considered a test of a gardener's skill but I know of no place where it can even be seen today. The rare double rocket is but one example of worthy plant material that has been lost to our gardens because no one cared enough to keep it.

You will not get out of gardening any more than you are willing to put into it in the way of work, time and love. If you are looking for a garden that will "take care of itself" you just might be riding the wrong hobby.





1973 Plant Sales and Shows

Annual Spring Plant Sale, Community Garden Club of Wayne. Saturday, May 5, 7 am - 3 pm. Spread Eagle Village, Lancaster Avenue and Eagle Road, Strafford, Pa.

Annual Plant Sale. Providence Garden Club of Pennsylvania, Wednesday, May 9, 10 am - 3 pm. Tyler Arboretum, Lima, Pa.

Annual Azalea Sale. Wayne Union Methodist Men. Thursday, May 10, 6 pm - 9 pm. Friday, May 11, 9 am -9 pm. Saturday, May 12, 9 am -12 noon. 210 South Lane Avenue, Wayne, Pa. Annual Herb Sale, Philadelphia Unit Herb Society of America. Thursday, May 10, 10 am - 2 pm. At the barn of Mr. and Mrs. George A. Reed, Jr., Bodine Road, Malvern, Pa., off Route 401.

Horsham Hospital Herb and Flower Sale. Saturday, May 12, 10 am - 2 pm. Butler and Limekiln Pike, Ambler, Pa. Rain or shine.

Rittenhouse Square Flower Market, Thursday, May 17, 9 am - 6 pm. Rittenhouse Square, 18th and Walnut Streets. American Iris Society, Annual Meeting, Philadelphia Marriott, May 29 through June 1.

Annual Rose Show of the Philadelphia Rose Society. PHS Headquarters, Saturday, June 2, 2 pm - 6 pm. Sunday, June 3, 12 noon - 5 pm.

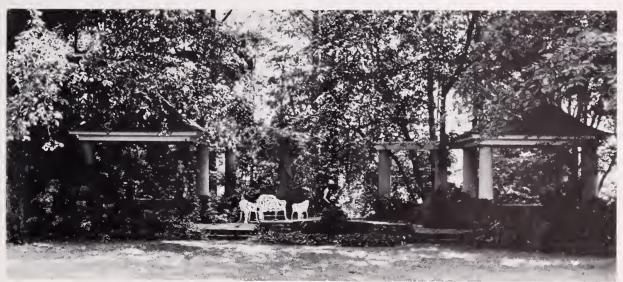
Annual Show — Middle Atlantic Regional Lily Group. PHS Headquarters, Saturday, June 30, 2 pm -5 pm. Sunday, July 1, 12 noon - 5 pm.

SUMMER GARDEN TO VISIT

The Ambler Campus of Temple University on Meetinghouse Road off Butler Pike. Several hundred acres are open daily except Sunday from 8:30 to 4:30.

Call if you want guided tour (643-1200). Campus includes several acres of herbaceous borders, planted

dry wall, perennial borders, and a collection of more than 700 species of woody plants including dwarf evergreens and ground covers. A greenhouse range with an extensive collection of flowering and foliage plants is included.



Temple University Ambler Campus Gardens.

18

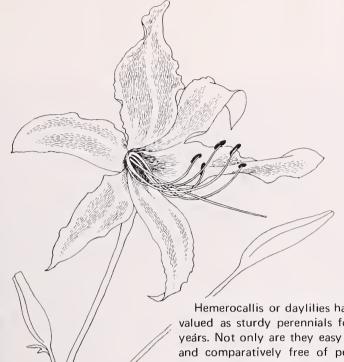
hemerocallis: GLORY OF SUMMER

by Gertrude S. Wister



Daylily Fleeta

photos by Edward Grovatt



Hemerocallis or daylilies have been valued as sturdy perennials for many years. Not only are they easy to grow and comparatively free of pests, but their lily-like flowers brighten the garden in the summer months after the early rush of bloom from bulbs, shrubs and small trees is over. So sturdy are the daylilies that it is easy to keep the same ones for years, without ever thinking of the possibility of enhancing the garden scene with new kinds.

In the late 1940's the daylily reached the status of a hobby plant with the formation of the Midwest Hemerocallis Society, which soon became the American Hemerocallis Society. With its wide adaptability and suitability for back yard hybridizing, the hemerocallis started on its new career. By 1968 there were over 12,000 registered cultivars.

With such an output, there are bound to be improvements, though the vast bulk of the new introductions will not have the distinction and quality needed to survive the competition. Improvements may be considered in several categories.

Color range. As time goes on, the new pinks are pinker, the reds redder, the lavenders more lavender. There are purples, ivories, crimsons, peaches, and blends of two or more colors. There are striking bicolors, and there are some varieties with delicate halos in the flowers, or strongly marked zones of contrast. Throats may be green, yellow or orange. Of course there are many fine new flowers in yellow, orange and

Gertrude Smith Wister is a graduate of the College of Agriculture of the University of Wisconsin with a major in horticulture. After many years as a garden consultant, she became assistant director of the Scott Horticultural Foundation of Swarthmore College and the Tyler Arboretum at Lima. She is the author of *Hardy Garden Bulbs* and of numerous articles on garden plants.

brown. Many varieties have the valuable characteristic of sending up new bloom stalks after the first flowering period is over.

Flower shape and size. In general the tepals (the three petals and three sepals that form the showy part of the flower) are wider. Sometimes they are ruffled, or the edges are finely crimped. Sometimes they are strongly recurved.

The substance of the flowers is better, enabling them to withstand rain and hot sun. There are more buds to a stem, sometimes an extraordinary number. Instead of fading quickly at day's end, many stay open late into the evening.

In size, flowers may be had that range from only two inches across to more than eight inches. The smaller flowers may be on low plants, 24 inches or under, or on plants about a yard high.

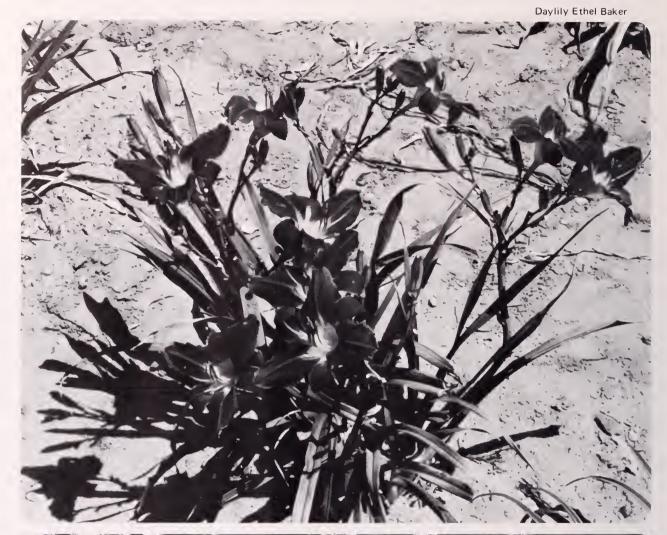
July is the height of the season, but it is possible to pick varieties for bloom from mid-May into September.

The tetraploids. Tetraploid plants are those in which the normal (diploid) number of chromosomes has been doubled. Tetraploids tend to have more vigor, more concentrated color in larger flowers, better substance, stronger stems and lusher foliage than diploids.

While tetraploids may appear spontaneously among plants, the daylilies have been induced through the use of chemicals. The prices of the newest may reach as much as \$100, but there are already some to be had at reason-

continued

hemerocallis





Daylilies used in landscaping

able prices. Tetraploids will probably replace diploids in the future.

The use of daylilies. Daylilies can be grown by themselves, setting each other off very well indeed. I think of them in a back yard garden where they dominate the scene through July. after an earlier fine display of bearded iris. Every morning their owner, John Lyster, a devoted gardener whom I know, picks off all the previous day's spent flowers thus enhancing the quality of an outstanding display. I think of them, too, as clumps against gray stone walls on an old New England farm that now serves as a summer place. We grow them in mixed perennial beds, and also in beds by themselves where they give us enjoyment all summer long.

Perennials in the blue-violet group look especially well with daylilies. The balloon-flower (Platycodon grandiflorum) with bells on three-foot plants from July into September, the globethistles (Echinops spp.) with flowers in tight balls and the blue salvia (Salvia farinacea) with slender spires of flowers and grayish foliage are a good trio. Buddleias in blue-violet and violet make good background plants. Clip the spent blooms from these plants for an extended season.

It is the intensely colored daylilies in red, orange and deep yellow that are best with these cool companions. The light yellow, pink, ivory and softly blended daylilies can be mixed with a freer hand with other colors.

Culture. Daylilies will perform well for many years without being divided. Their ability to survive gives them a prime advantage over many other perennials. While they do not need frequent division, there are advantages in not letting the clumps get too large for fairly easy digging. It is also possible to cut off pieces from old plants for replanting. Complete replanting however gives the best chance for soil renovation.

Good drainage and either a clay or sandy soil will suit them, if there is enough organic matter to keep the soil from compacting yet retain adequate water. It is best to avoid chemical fertilizers at planting time. However, if you wish to use a small amount, it should be dug thoroughly into the site a week or so before the plants are set. Organic

fertilizers are safer, but they too should be well mixed in the soil. A sunny site is best, but some shade will still permit good growth and bloom.

Usually the growers ship plants in the late summer. If they are well watered, plants should be rooted safely before winter, but a mulch to forestall heaving is needed the first winter, especially if the plant is very small.

We keep our plants mulched with wood chips. In one section, black plastic was laid down around the plants, and chips thrown over to conceal it. It has been a great help in keeping down weeds. During severe dry spells, the beds are thoroughly watered from time to time. The plants would survive the drought, but the water insures better performance.

Our fertilizing program is sketchy. Some springs we do scatter 0-20-20 (which we have on hand for daffodils) mixed with dried manure. Complete fertilizer such as 5-10-5 could be used, scattered around the plants and scratched in lightly.

Pests. We have never found it necessary to spray. John Lyster sprays once with malathion in the spring, but says he thinks it isn't really necessary. If there is trouble with many aphis, or thrips, a program of malathion may be needed. Thrips cause deformed and dying flower buds, twisted stems and corky brownish areas on stems.

What to plant. In choosing daylilies, consult the lists of specialists. With many hundreds available, even the specialist can list only part of them, and following a "recommended" list might make it necessary to buy from a dozen sources. Pay attention to dates of introduction. If a specialist grows an old one, it is probably a good one.

Try a pink, a cream or ivory, a red or two. Try a tetraploid. The lists offer lots of descriptive matter to help you choose.

The journals of the American Hemerocallis Society are worth reading; especially useful is the spring 1968 handbook of the American Horticultural Society, a joint effort with members of the Hemerocallis Society. The PHS Library has these.

Visitors are welcome to see our collection of about 150 varieties, an ex-

tension of the plantings of the Scott Horticultural Foundation of Swarthmore College. It is between the football field and the entrance at 735 Harvard Avenue. All plants are labeled.

Visitors are also welcome at John Lyster's garden, 19 Stratford Avenue in Aldan. If they go there in the latter part of May, they will see a glorious iris rainbow. If they go in July, they will see a less complete rainbow, but a lovely mass of gay flowers nevertheless. Mr. Lyster's garden is beautifully maintained, and the varieties are planted to set each other off to the best advantage. His garden is planned to give a great show in July. In our garden there are also early and late varieties, giving bloom from mid-May into September.

One nursery in our area specializes in daylilies. Plan a visit to Ed Grovatt's on Neck Road in Burlington, New Jersey. Perhaps you'll leave with a few plants to grow in your garden.

Now, as I near the end, I can't resist making a few recommendations. For the person who has had very little experience with daylilies, these would be rewarding:

Alan - Cherry red, early midseason. 32" Aten - Large orange, long bloom midseason to late. 36"

Buried Treasure - Large light yellow, early, 32"

Curls - Small ruffled flowers, pale melon. Early midseason. $20^{\prime\prime}$

Frances Fay - Large melon, prolific. Midseason. 20"

Golden Chimes - Miniature flowers on stems to 36". Midseason.

Green Valley - Opens in evening. Large ruffled pale yellow. Midseason. 36"

Ivory Treasure - Opens in evening. Cream with greenish yellow throat. 28"

Kathleen Elsie Randall - A tetraploid to try. Creamy blend with gold, lavender and pink. Midseason. 30"

Luxury Lace - Rather small lavender pink, green throat, frilled. Midseason. 32"

Postlude - Late pink. 32"

Satin Glass - Pastel melon, green throat. Midseason. 36"

These are old enough to be inexpensive, but are still very good. For the beginner, they will open the door to daylily pleasure.

books and the green world

Most "how-to" books are practical guides that instill little or no gardening philosophy. That approach, however, does not seem to hold among the books on vegetable and fruit growing. The authors of these books seem to take pride in passing on their philosophy, and some exhibit strong feeling toward their subject. Whether the author is explaining how to espalier a fruit tree or harvest a bumper crop of Dr. Martin pole beans, a certain amount of "look what I did" finds its way into the writing.

Researching this article meant spending time with books like Sturtevant's Notes on Edible Plants. Few books about the origins of plants are as comprehensive as Sturtevant's which lists 2,897 edible plants, most of which are cultivated. The book was the 1919 annual report of the New York Agricultural Experiment Station and is still available from a few sources at nominal cost.

A paperback volume on the history of fruits and vegetables by Dorothy Crispo is entertaining reading. If you want to know where carrots originated or that herbalist Gerarde recorded his observations on sweet cicely in 1597, you'll find the answers in the Crispo book.

If you want historical and practical information *Vegetable Gardening* edited by W. Robinson is the book to use. Vegetable gardeners have spent many hours with the book in the 53 years that it has been available in the PHS Library. Many vegetables commonly cultivated for centuries have disappeared from most commercial sources in the past 75 years. Some gardeners are anxious to find and grow these older varieties. As they slowly become available again, Robinson is a good starting point for research because he lists the old, commonly grown varieties.

Other historical sources are the early plant and seed catalogs. The PHS Library has a back file of catalogs of local seedsmen such as Burpee, Landreth, Waterer and Peirce that can be used in the Library. The first fruit books printed in America came from Philadelphia. These early books are part of

fruits and vegetables

by Julie Morris



the Library's Pennsylvania collection and are available for reference. The number of vegetable and fruit books available at PHS present a problem when trying to select a few for discussion, so I've chosen those that seem to offer the broadest range of information.

The recent back-to-the-soil movement has stimulated a renewed interest in vegetable and fruit growing. Our readers easily fall into two categories: beginners and long-time gardeners. The veteran vegetable grower may be interested in trying a new pruning technique, looking for unusual vegetable and fruit varieties or comparing companion planting to the standard methods of controlling fruit plant pests. The novice needs advice on laying out the garden, soil preparations, how and when to plant, what plants are best started from seed or how many fruit trees or berry bushes to buy for his available space.

George Abraham's book *The Green Thumb Book of Fruit and Vegetable Gardening* is almost encyclopedic in its scope. Abraham is very thorough whether discussing old fruit varieties, what a nectarine really is or the differences between garden hoses. Vegetable gardening, planting and maintaining, is covered in detail. There are good sections on tropical fruits for house cul-

ture, nut growing and greenhouse gardening for vegetable growers as well as discussions on all the common pest problems.

Although out of date on pest control and fertilizers, *Vegetable Gardening* by Charles Nissley, published in 1942, has good information on nutritional content of different vegetables. Tables provide data on the expected percentage of seed germination, amount of seed needed for one acre and for each hundred foot row, seed longevity and weight, expected yield, planting time, depth and distance.

Dwarf Fruit Trees, Indoors and Out by Robert Atkinson covers all the essentials of buying, planting, and the growing of fruit trees for the garden. Fruit trees and containers as well as indoor culture are also discussed. Pruning recommendations are easily followed and will alleviate some of the fear most new gardeners have about cutting off even a single branch.

Two lively fruit books are *Growing Unusual Fruit* by Allan Simmons and *Grow Fruit in Your Greenhouse* by George E. Whitehead. The Simmons book discusses fruit plants you've probably never thought of growing, for example, passion fruit (*Passiflora edulis*) and rowan berry (*Sorbus aucaparia edulis*). Complete cultural requirements are given as well as sources for these plants. Nothing is more frustrating than reading about a plant that you can't find anywhere.

Whitehead writes that any greenhouse can become a year-round orchard or vineyard. Grapevine culture is covered in interesting detail—you will also learn how to grow peaches, melons, berries and even figs. If you have a greenhouse try some of Whitehead's suggestions.

The Library has several periodicals on fruit, vegetable and nut growing that are up-to-date references for food crop information.

Whether you grow your vegetables and fruits in barrels on a sunny porch or have a five-acre garden to plan, the PHS Library has books, periodicals and catalogs on almost every edible plant.





fruit sources

Baums Nursery R.D. 4 New Fairfield, Conn. 06810 Dwarf fruit trees

Bountiful Ridge Nurseries Princess Ann, Md. 21853 Orchard berries, fruits and grapes

Leuthardt Nurseries
East Moriches
Long Island, N.Y. 11940
Dwarf fruit trees, espalier fruit trees, grape vines, berry plants

Southmeadow Fruit Gardens 2361 Kilberry Place Birmingham, Mich. 48009 Old and new fruit varieties (catalog \$1)

vegetable seeds

George J. Ball, Inc. West Chicago, III. 60185

Burnett Brothers 92 Chambers Street New York, N.Y. 10007

Burpee P.O. Box 6929 Philadelphia, Pa. 19132

Harris Seeds Moreton Farm Rochester, N.Y. 14624

Herbst Brothers 1000 North Main Street Brewster, N.Y. 10509

Jardin Botanique Montreal, Canada

Landreth Seed Company 2700 Wilmarco Avenue Baltimore, Md. 21223

Nichols Herb and Rare Seeds 1190 North Pacific Highway Albany, Oreg. 97321

George W. Park Seed Company Greenwood, S.C. 29646

Saier Seeds Dimondale, Mich. 48821

Sutton & Sons, Ltd. Reading, England

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Wiberg, Hugh. *Backyard Vegetable Gardening*. Exposition Press, New York, 1971.

Marianna M. Hornor received the 1972 Zone V Award of the Garden Club of America. She was cited for her leadership and achievements in horticulture and for the knowledge and artistry that she so generously shares. A trained textile designer, she incorporates her love of plants into her award-winning pressed flower exhibits. Ms. Hornor is a member of the PHS Council.

photo by June Vail



Georgette L. Johansen prepared the wildflower slides for the PHS Library circulating exhibit. Her interest in wildflowers began as a child when she walked and explored with her naturalist father in the then sparsely settled Upper Darby area.

digitalis - excelsior strain

While biennials are a bit more work than annuals, there is one that I feel is well worth the effort for the display it provides: Sutton's Excelsior strain, digitalis. I have only grown the white variety so whether my procedure would work on other colors I don't know, but I presume it would. The Excelsior strain has the flowers growing all the way around the stalk and it is beautiful in the garden. I have only been able to get white variety of Excelsior from Sutton's seeds in England. However, once you get a packet of seeds, that's all you'll need. I've grown the digitalis from the one packet of seeds that I bought from Sutton's almost ten years ago.

Digitalis will grow in either sun or light shade in a rather moist location. I have used no special fertilizer-just what I normally use on the flower beds. When I transplant from the cold frame to the flower bed, I always dig a bigger hole than necessary and put in compost and peat moss.

I start the seeds in a flat in July. I thin the seedlings when they are large enough to transplant and place them in the cold frame about six inches apart. They should be kept watered. I leave the seedlings in the cold frame, closing the frame in cold weather until the following April and then transplant them to flower beds.

When the plants are through blooming I cut off the flower heads and leave the plants in the garden. By the end of August or early September new side shoots will have developed from the crown. I cut off the new shoots and if possible get a bit of root with each shoot; I then strip off some bottom leaves, dip the cut end of the cutting with root into rooting compound and plant in the cold frame. These new cuttings should be kept moist and shaded for several weeks. When sufficient cuttings have been made I remove old plants from the flower bed and discard. Citrus fruit crates with a piece of burlap on the top, but not on the sides, give excellent shading, while allowing rain to penetrate. These cuttings should remain in the cold frame all winter and be placed in flower beds in April. By keeping a constant supply of cuttings the plants will remain white, whereas if propagated from collected seed the plants may revert to other colors. By growing digitalis from cuttings, the clumps are much larger and give more bloom with less effort than growing them every year fresh from seed.

Marianna M. Hornor

Editor's note: Sutton's latest catalog does not list the white Excelsior strain separately. White is available only in packets of mixed seed. The disappearance of the white from the catalog is an excellent example of the problem Ms. Garra points up in her article on biennials in this issue.

epigaea repens

When asked to name my favorite "wildling" I am tempted to cite whatever is in bloom at the time of the question. However, the flower I would miss most from my garden would be the mayflower, springbeauty, trailing arbutus or whatever your section of the country calls Epigaea repens.

Arbutus is an evergreen trailing ground cover, at best three inches high. It blooms in May and the plants are covered with clusters of pink and white starry flowers with a most heavenly fragrance that is worth getting down on your knees to sniff. To me, it was even worth the surprise the postman must have gotten the day he caught me flat on my stomach photographing them.

The arbutus I have in my garden was taken from a woods in Maryland where a road had been cut through. The earth was being washed out from under the arbutus on the bank along the road. Many plants had dried out and fallen along the wayside.

I took a piece of arbutus, about seven or eight inches around, that had some soil on the roots and seemed to be in good condition. I just lifted it off; there was nothing under the plant since the soil had been washed away.

I planted it in my front garden under an Azalea nudiflora (also rescued from erosion) where an old pear tree stump had rotted away. I remembered reading that the soil for arbutus must be acid with humus, have good drainage and partial shade at least over the hot summer. After the patch started to spread I planted maidenhair fern (Adiantum pedatum) through the arbutus and it made a perfect dappled shade for the summer. The arbutus now fills an area about three feet square.

Georgette L. Johansen

ribes

The early horticultural societies were concerned primarily with fruits and vegetables and only later came to stress plants whose only function was aesthetic. For various reasons I settled on the gooseberry (*Ribes spp.*) as embodying all the fascination of horticulture in its largest sense. The antiquity of its association with man, its reputation for paying dividends under adverse conditions, its early ripening and the very human traditions associated with the gooseberry contests of England and Wales all played a part in its becoming one of my favorite plants. But its rarity in the twentieth century, contrasted with its early popularity in post-colonial America made an even greater claim on my interest. Most people have never seen a gooseberry outside their fruit cocktail, and a more tasteless introduction to a flavorful and varied fruit is hard to imagine.

There are red-fruited gooseberries with intriguing names like 'Farrow's Roaring Lion,' 'Boardman's British Crown' or 'Hartshorn's Lancashire Lad'; green types like 'Early Green Hairy' or 'Green Walnut'; white-fruited cultivars such as 'Taylor's Bright Venus'; and yellow ones like 'Hill's Golden Gourde.' These date back to the competition among breeders and growers for the largest and most luscious looking berries. Eating these giant berries was often less satisfactory than looking at them. The common modern cultivars are more prosaic in name, more limited in number and often more flavorful. There are probably not more than 20 cultivars in commerce in the United States today, but in the middle of the last century there were close to a thousand published names.

The cultivars of greatest use to us are derived from selections of our native gooseberries, or from hybrids of these with the European fruit. It was early found that the ones the colonists brought with them were so prone to disease as to be almost worthless.

Gooseberries are heavy feeders and respond well to organic mulches. For best bearing they should be pruned heavily and yearly. Fruit is borne on one-year-old wood and pruning should reflect this. I prefer to grow mine as standards, or "trees," for easier picking. This shortens the life somewhat but makes an attractive ornamental conversation piece that feeds the stomach as well as the soul.

Among those I prefer to grow are 'Glendale' and 'Downing' because they are easily available, produce large, delicious dessert fruit, and they bear consistently well.

A final note for those concerned with the legality and advisability of growing ribes species because of the white pine blister rust: check state laws.* Many species of ribes are resistant to the disease, and hence do not serve as alternate hosts. Consequently, they can safely be used.

Dr. Richard W. Lighty

*There are no restrictions in Pennsylvania. State Dept. of Agriculture: New Jersey (Trenton 1-609-292-5575); Delaware (Dover 1-302-678-4811). Editor.

rosa floribunda europeana

A "rose is a rose is a rose is a rose" may be a quotation, but it just doesn't describe roses. Between *Rosa chinensis* of the Chinese dynasties to the grandifloras of modern times there are more varieties than seeds in a watermelon. Some species, such as hybrid teas and floribundas, boast thousands of varieties. So what's a guy to plant?

My solution was to list my requirements and compare. First I wanted roses that would produce a mass of bloom to cover the entire bush. Next I desired varieties that would not grow too tall so they could be grown either as a border or in beds. Of course, hardiness was most important; I just couldn't afford to replace plants after every winter. Not the least consideration was cost. Some bushes are quite expensive, limiting the number I could plant and grow. Matching all my requirements against the species available eliminated all of them except floribundas, so my decision was made.

Of all the floribundas, my choice is Europeana. This cultivar produces hundreds of brilliant deep red blooms and when planted in groups is certain to catch the eye of all passersby. The foliage ranges from a bronze when young, to a healthy, glossy dark green when mature. The American Rose Society has rated this rose 8.5 out of a possible score of 10 on the point scale. Sprays of Europeana are winning top of the class in rose shows throughout the country. This rose could just be the floribunda of the century! So when you are thinking of roses, think "of floribundas of floribundas of floribundas."



Dr. Richard W. Lighty is coordinator of the Longwood Program in Ornamental Horticulture at the University of Delaware. In 1966 he spent four months in Korea collecting plants for the Longwood-USDA Plant Introduction Program. Lighty is a member of the PHS Council.





Joseph J. Mammino of Springfield, Pa., is a consulting rosarian and an accredited judge of the American Rose Society. He is past president of the Delaware County Rose Society and an authority on floribunda roses on which he frequently lectures.

Dr. & Mrs. Joseph T. Riemer Quarry Hall Road R. D. 1 Morristown, Pa. 19401

Members of PHS tour follow the leader into Webb's Mill Swamp. (See story on page 2.)

photo by Edmund B. Gilchrist, Jr.

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green Scene

HORTICULTURE IN THE DELAWARE VALLEY





green scene

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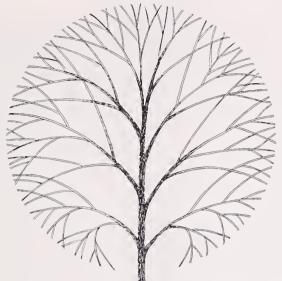
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Front cover and back cover photos by Len Shackleford



a BIG subject

When we started to plan this issue on pruning, some of us had serious reservations about the advisability of the idea. Pruning is considered, by some, to be a dull chore. Of course, THE GREEN SCENE should carry an article on the subject once in awhile—but a whole issue, never. But, others of us argued, the subject of pruning constitutes most of the questions posed to our horticultural staff.

We are glad that the advocates of the idea persisted. As we looked into the subject we reaffirmed our conviction that pruning is a major part of horticulture, as important as propagation or garden planning or pest control. If you stop to think about it, you will see why. Pruning makes ornamental shrubs beautiful. It keeps fruit large and choice and within reach. It keeps trees healthy. The theory of pruning involves a knowledge of plant physiology. The techniques involve a sense of aesthetics and many areas of special expertise. Pruning is, in fact, an immense subject, with many ramifications.

As it turned out, we found ourselves unable to cover the field in a single issue. So we have divided it. This issue deals with basic theory and the pruning of shrubs, topiary, and small trees. Later issues will cover trees, particularly the maintenance of the mature shade trees that form so important a part of many gardens and open spaces. In this way we hope to do justice to all facets of this essential horticultural practice.

Ernesta D. Ballard

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PRUNING FOR BEAUTY



by Frederic L. Ballard



Figure 1

The reason for pruning trees and shrubs is to make them beautiful. Many of us may be shy about admitting it, but beauty is the objective of gardening. Until we are willing to acknowledge that we prune our plants to make them pleasing to the eye, we will never understand what pruning is all about.

Now of course I recognize that there are exceptions. We prune fruit trees to improve the yield. We prune street trees to keep the foliage in balance with the restricted root system, and perhaps to keep the branches out of the telephone wires. This could be called pruning for utility. But I am not talking about such pruning. I am talking about the pruning of ornamental shrubs that contributes to gardening as a form of art.

Fortunately for most of us, art in

gardening, unlike art in painting or sculpture, still revolves around the traditional elements of line, balance, proportion and composition. We may mix these elements a little differently than the great garden architects of the 17th and 18th centuries, Le Notre or Launcelot Brown, but we still operate within the same framework. Even the most modern garden owes more to classic aesthetics than to abstract impressionism.

The challenge of pruning begins with conceptualizing the plant, both as a specimen in its own right and as a component of a larger design. Every species has its own distinctive habit of growth, its own relationship of stems, branches and twigs, its own combination of leaf shape, color, size and texture. Their forms range from the dark green, heavy, almost opaque mass of hybrid rhododendrons to the tracery of forsythia or spirea. Some, like the laurel, are round and sinuous. Others, like many viburnums, are angular. Before we undertake to prune any of them, we must have in mind a platonic ideal of the species, an image in the mind's eye of how the plant looks when it is growing to perfection.

The next step, after forming our platonic ideal, is to transpose it to the plant. Here the chief considerations are function and size. Much shrubbery serves to conceal. It hides the cellar window, or the garbage can, or the air conditioner. Other plants serve as accents or punctuation marks, a vertical marker beside a door, a mound of foliage to signify the end of a terrace, a row to serve as a fence or a hedge. Still others are grown for their springFrederic L. Ballard is an amateur horticulturist who developed a skilled eye for aesthetic pruning through his interest in bonsai. (See The Green Scene, September, 1972.)

photos by Len Shackleford

Figure 1. Shadows of an azalea and a holly against a wall. As the sun sets, the pattern changes from minute to minute.

Figure 2. The azalea has been carefully pruned to frame the statue without obscuring or touching it.

Figure 3. This old azalea is heavily pruned each spring after flowering. Note: (a) its lower branches are clear of the ground; (b) the definition of the curving branch on the extreme right; and (c) the visible corner of the wall against which it is planted.



Figure 2



Figure 3

time bloom or for the enjoyment of their winter patterns against a wall. In all these situations size can be as important as form. The plant should accentuate the door, not block it. The screen should hide the air conditioner without impairing the view through the living room window above. The pruner must always bear in mind not only the shape but also the size to be achieved.

Well, you may say, that is all very interesting, but there must come an end to philosophy; let's be practical, where and when do we cut?

As to where, the answer is simple. Make your cuts where they will enhance the form of the plant and at the same time reduce it to the desired size. If you are dealing with a yew protruding above a windowsill, make a mental outline of the plant's shape with its

highest point transferred to a level six inches below the sill; select all branches that extend beyond this outline; follow each of them down to a major crotch six inches or a foot below the outline, and cut it there. As the long branches fall away, you will find that there are shorter branches ending naturally at or near your mental outline. In their totality these will form roughly the same outline, smaller, but otherwise unchanged. Because you have cut individual branches instead of shearing the tips, the plant will have a natural shape, and because you have made your cuts at various depths in the interior, it will have a natural density.

At this point some refinements are in order. As you reach into the plant to make your cuts, you will sense its structure; that is, the arrangement of its principal stems and branches, and you will be able to locate your cuts so as to clarify and emphasize that arrangement. You do this not only by following the time-honored admonition to eliminate any branch that crosses another or that duplicates the branch above or below it, but also by more subtle techniques. If you sense a large, strong branch extending in a desirable direction, prune the shoots and twigs along that branch until you can see the entire branch with its foliage as a coherent mass, slightly separated from the mass of other branches. The amount of separation can vary from a fraction of an inch to several inches, and the separation can be partial or complete. In any case the result is to reveal to the viewer how the plant is put together.

Once you have learned to differen-

continued



Figure 4



Figure 5

Figure 4. The wall is planted with a row of azaleas and rhododendrons. Note: (a) both the top and the bottom of the wall are clearly visible in the spaces between the plants; (b) the individual shrubs are separated; and (c) space exists between the shrubs and the wall.

Figure 5. The Ligustrum ovalifolium, if left to its own devices, would soon become an undifferentiated mass of dense foliage. Pruning reveals the structure and permits the eye to appreciate the depth of the plant and the presence of the wall behind it.

Figure 6. The separation between this laurel and the trunk of the oak permits the eye to follow the clean, sharp curve of the tree and also accounts for the laurel shadow falling across it.

tiate one branch from another by this kind of pruning, you can begin to develop a beautiful structure by selecting the branches to be retained, controlling the dimensions of their foliage masses, and adjusting the spaces between them.

Here is where your aesthetic sense enters the picture. No one can tell you the ideal balance or proportion for a given plant in a given spot; that depends on your mental image. But I can give you a few rules that seem to apply more or less across the board:

1. Don't let branches touch the ground. There is something unsatisfactory about foliage resting on the soil surface. Cut off twigs below the main branch and then remove smaller branches and twigs from the branch itself until the foliage mass lifts off the

ground. You will see new depth and definition. (Figure 3.)

- 2. Branches that touch a wall are also uncomfortable to the eye. Cut them back far enough to give a feeling that the plant has room to grow. (Figures 2 and 4.)
- 3. Don't let the branches of different shrubs touch one another. It's quite all right for them to overlap, but there should be some space between the foliage masses to provide visual definition. The same applies in somewhat lesser degree to two branches of the same shrub. They can approach one another and blend into one another in spots, but there should always be enough differentiation to convey a sense of structure. (Figures 4, 5 and 6.)
 - 4. Remember that plants are three-

dimensional. Keep spaces between branches to invite the eye into the interior of the plant so that the viewer appreciates its depth. If the plant is not being used to conceal, let the viewer see completely through it. This openness is particularly effective where the background is a nicely textured wall or a pleasant vista. (Figures 2, 4 and 5.)

5. If the plant is in juxtaposition to an architectural feature, a gate, a wall, or a pillar, keep the plant small enough and open enough so that it does not obscure the structure it is meant to enhance. A viewer likes to have at least a glimpse of the base of any structure. The eye enjoys following the vertical line of a pillar or the horizontal line of the top of a wall. (Figures 3 and 4.)



6. Be patient. It takes repeated pruning over many years to develop definition and depth. Do not try to speed things up by pulling branches into position with wires or strings. If a branch is too long, shorten it by cutting back the two or three longest twigs each year. If a branch extends in the wrong direction, for example, too much toward the right, select a twig on the left side of the branch to be the new leader and cut away most of the growth to the right of that twig. After two or three repetitions of this treatment, both the mass and the direction of the branch will have moved noticeably to the left. The back cover shows a wellformed branch. The proliferation of twigs is the result of several years of careful pruning.

7. Be conscious of shadows. If your shrubs are well pruned, you will see the results in their shadows on walls or paving or on the trunks of nearby trees. One of the fascinations of a well kept garden is to watch the changing shadow patterns as the sun moves across the sky. (Figures 1 and 6.) The front cover shows the reflection of an English holly. Effects like this are seen only where the shrubbery is kept sufficiently open to permit the sun to shine through.

All this is by way of answering the question, where should the cuts be made. I also undertook to answer the question, when. Here the answer is simple. You can prune any time the spirit moves you. The only two rules I observe are: first, prune flowering shrubs as soon as you can after they finish blooming to allow the longest

possible time for next year's flower buds to form; second, don't prune fast growing plants during the six weeks before the first frost—they are apt to put out new growth which won't have a chance to harden before the frost nips it.

In truth, a dedicated pruner never goes into the garden without shears. You never know when a glance at a plant from a different direction will reveal something in its structure that cries out to be accentuated or eliminated. I rarely look at any tree or shrub without performing a bit of mental pruning, and because of this I am acutely aware of the different patterns and structures that characterize the various species. It has doubled the pleasure of horticulture for me. I hope it will do the same for you.

what happens inside plants when they are pruned

The how and why of pruning plants are considered elsewhere in this issue. I want to consider what happens inside the plant when we prune our favorite shrub, bush or tree. These internal processes are not fully understood, so if you are not clear about physiological changes in plants during pruning, that's understandable. Because plants have different "styles" of growth they respond differently to pruning, and we can only set down what generally occurs after pruning is completed, realizing that different plants respond differently.

The growth of plant stems and branches is regulated by a delicate balance among many plant growth chemicals, the phytohormones. Some of these phytohormones are auxin, gibberellins, cytokinins, ethylene and florigen.

The dominant terminal bud. The most studied of the phytohormones is auxin, which exists in only one form in nature, indole acetic acid (IAA). Auxin is a relatively simple chemical and because only the one form is present in nature, much experimental data is available about its activity. IAA is produced in all plants, with the highest concentration in the apical region of the stems, that is, the terminal bud or growing point. We have been able to make chemicals that produce the same response as the natural auxin. Synthetic auxins are often used by gardeners as rootpromoting hormones; for example, indole butyric acid (IBA) and naphthalene acetic acid (NAA). The IAA produced in the terminal bud is transported throughout the plant stem and root, away from the terminal bud and down the stem. The amount of IAA present in the different parts of the plant causes the parts to grow at different rates. The terminal buds and stems are stimulated to grow by IAA, while IAA inhibits the development and growth of secondary buds toward the base of the stem because the secondary buds are sensitive to low levels of IAA. That is why buds at some distance from the terminal bud remain dormant under ordinary conditions. Likewise, IAA inhibits root growth when the level of IAA exceeds a certain critical amount. This suppression of growth has been called "apical dominance." The gardener sees the dominance of the apical bud over the development and growth of the secondary (side) buds and shoots on many different plants, for example, in roses, chrysanthemums, geraniums, Norway spruce trees, and many others. "Apical dominance" occurs when the apical bud produces enough IAA, which is translocated down the stem, to suppress the growth and development of the side buds (Figure 1).

Removal of the terminal buds by pruning releases the side buds from apical dominance by removing the source of the IAA. The side buds are then allowed to grow and produce a shoot, which itself shortly begins to exert "apical dominance" on new buds on the new shoot (Figure 2). When pruning shrubs, the "breaking" of apical dominance is noticed in the development of side buds, with one or more side buds per stem developing into branches. The farther the side bud is from the terminal bud, the less strong is the effect of apical dominance; thus even with the terminal bud intact, lower side buds may develop as they become progressively more distant from the terminal bud.

In most plants side bud development is a desirable response. The additional growth makes the shrub more dense, allows the rose cane to develop strong new basal shoots, makes the hedge appear fuller, or gives more potential flower-bearing branches.

Why side shoots grow. Gibberellin, another phytohormone, is involved with auxin in regulating growth. As many as 30 different forms of gibberellins have been found in plants, as compared to the single form of auxin as IAA. For this reason, we don't understand how gibberellins work as well as we understand how IAA works. Gibberellic acid (GA) was the first identified form of gibberellin. GA stimulates stem elongation. Gibberellic acid is found in

all organs of higher plants but is most abundant in terminal buds. Unlike IAA, GA can move throughout a plant in any direction. Therefore, the removal of the terminal bud in pruning will not disrupt GA content in plant tissues since other remaining parts of the plant can supply the needed GA. When you remove the terminal bud through pruning, the IAA level drops but the GA level remains nearly normal; hence growth continues, causing secondary buds to develop.

The other phytohormones, especially cytokinins, abscisic acid, and florigen have some specific effects on cell elongation and enlargement, and plant development. However, they are not strongly affected by pruning since they normally are produced by the plant leaves.

Wound healer? Ethylene is a simple organic compound that exists as a gas and is ubiquitous in plants. Even though it is a simple chemical, it has been difficult to detect and only recently has its action on plants been classified as that of a phytohormone. Ethylene probably causes plant growth responses by interacting with IAA. It is the ethylene produced in the tissue remaining after a stem is pruned that may be responsible for the way a wound responds. The ethylene stimulates respiration, which in turn favors growth. Eventually new wound tissue is formed which effectively seals off the cut area. The wound tissue is noticeable as the formation of callus tissue which is evident soon after pruning wounds are made.

A fatty acid, appropriately called traumatic acid, has been found in wounded parts of some plants. It may be produced by the interaction between ethylene and IAA. Traumatic acid's function may be twofold: increase cell division and act as a building block chemical to form wound tissue.

Here's how it may help to heal: the damaged cells in the area of the wound apparently release traumatic acid, which moves to the remaining intact cells. The traumatic acid stimuDr. Svec is a plant physiologist at the University of Delaware. He was trained in the Department of Agronomy at the University of Nebraska (B.S.) and Purdue University (M.S., Ph.D.). At present his research involves stress physiology of plants, especially nutrient and moisture stress. He also teaches courses in plant physiology and plant metabolism.

lates the production of wound tissue, possibly by increasing cell division. Thus the open cut, caused by pruning, is sealed over by the plant through the initial production of ethylene, which in turn stimulates production of traumatic acid. The traumatic acid interacts with phytohormones in the remaining cells and causes the cells to divide to form wound tissue (Figure 2). To prevent fungal invasion during wound healing, it is recommended that some kind of artificial sealer, such as shellac, asphalt paints, or waxes which serve as an "artificial bark," be applied. Also the sealer can prevent the loss of water from the open cut, thus enabling the plant to begin growing the secondary buds more readily.

Good pruning practice requires using sharp instruments when making cuts. Sharp instruments prevent excessive "smashing" of the plant tissue and damaging more cells than necessary. Many more cells are left intact to participate in the wound healing process.

Almost without exception, damaging or cutting plant tissue causes increased respiration in the remaining live plant. The increased respiration may be caused by the production of ethylene or by some other not understood sequence; nonetheless the metabolic activity of the tissue is increased. Thus the timing of pruning is important so that increased metabolic activity does not occur when it is undesirable. Pruning is undesirable which removes large quantities of the leaves when they are making food by photosynthesis for the maintenance and expansion of the plant, whereas the removal of "sucker" tissue, which is probably not contributing to the food production, is desirable. Pruning some plants when the growth process is beginning may be undesirable because the stored reserves present in the removed tissue could be used by the plant for growth. Therefore, it is important to know the growth cycle of the particular plant that is being pruned so that removal of tissue occurs when the least stress is

put on the plant; that is, prune when the normal growth process will be least interrupted.

Summary. The probable sequence of events resulting from pruning involves initially the release of secondary buds from apical dominance, with branches starting to develop as the supply of IAA from the terminal bud is removed. The level of gibberellic acid in the side buds is higher than that of IAA, so the side buds begin to develop. The open cut begins to seal itself against the entry of diseases and insects immediately by means of the

wound response which involves traumatic acid, GA, IAA and ethylene. The production of new periderm tissue begins to form the new corky layer. The respiration in the cells of the remaining tissue increases to support the new demands for "building block" chemicals for growth of secondary buds and wound tissue. With all these readjustments taking place, the plant is certainly under stress at the time of pruning, so proper timing and good cultural practices must accompany pruning in order to minimize the damage to the plant which could result.

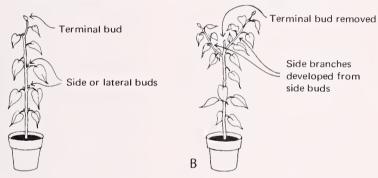


FIGURE 1. Apical dominance by terminal bud, (A). Removal of terminal bud allows side branches to develop, (B). External application of auxin (IAA) to cut where terminal bud was removed will prevent side bud development; thus apical dominance can be maintained artificially.

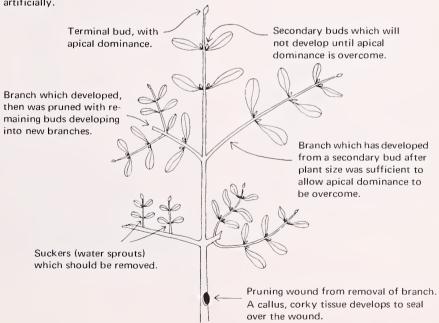


FIGURE 2. Many of the common plant problems which may eventually involve pruning.

pruning trees down to size: BONSAI



by Dorothy Young

From 1963 to 1970 Dorothy Young operated the second largest bonsai nursery on the East Coast. She no longer sells bonsai but maintains a collection for her own pleasure, for her classes and for exhibition. She was one of the founders of the American Bonsai Society and for six years she edited *Bonsai*, the journal of the American Bonsai Society. Ms. Young is an alumna of the Barnes Arboretum.

I will never forget the first time I saw bonsai. They were incredible. How could a tree be so small, so beautiful, and-alive! They were old Japanese bonsai exhibited at a spring flower show in suburban Philadelphia during the late 1950's. They belonged to R. Gwynne Stout who later was to be president of the Pennsylvania Horticultural Society and a founder of the Pennsylvania Bonsai Society. I immediately was captivated and the wonder has never worn off. Since then I have been growing, teaching, writing and learning bonsai. I also operated a small bonsai nursery for seven years before closing it in 1970.

Today, most of us—gardeners and the general public alike—realize that there is no secret to these dwarfed trees; they are the result of timeless, well known horticultural techniques infused with art. For thousands of years gardeners have been training plants for specific purposes. With bonsai the object is a beautiful tree in miniature. The method is pruning.

Bonsai are pruned from seedling to demise; every part is pruned, from the top of the trunk to the tip of the roots. Pruning makes a bonsai small, keeps it small, and shapes it to a pleasing, often beautiful, form. I have discovered bonsai can be grown without imported oriental containers, without using rare species or dwarf conifers, and without wire on the trunk or branches. Without any of these, but not without pruning.

Chinese bonsai. In Japanese and American bonsai pruning is usually combined with other techniques, such as the use of copper wire, to shape and position parts of the tree. However, last year in Hong Kong I saw beautiful Chinese bonsai trained by pruning alone. This "clip and grow" method was developed by the Lingnan School in southern China during the 19th century and was patterned after trees in Chinese painting. The handsomely trained Chinese bonsai in the photograph is from the collection of Wu Yee-sun, a noted banker and amateur bonsai grower in Hong Kong. The Bougainvillea spectabilis was shaped entirely by the Lingnan method. No wire or mechanical braces were used. Mr. Wu explained how the shaping is done. The trunk, or a major branch, is cut off at the desired location; its

replacement is permitted to mature. When its shoot reaches the desired thickness, it is cut back and another period of growth follows. The process of clip and grow is repeated again and again. Several pruning cuts on the pictured bonsai are visible. They occur where the tree changes direction abruptly. The clip and grow technique appeared to be very popular in Hong Kong where I found many other fine examples of Lingnan bonsai.

The Lingnan method follows the grand tradition of pruning to shape trees to size and form. After all, the first dwarfed trees and the prototype of bonsai were, and still are, pruned by nature: strangely shaped specimens broken by ice, torn by winds, gnawed and trampled by animals, and brought down from the mountains by humans to be planted in containers as ornamentals.

The contorted windswept juniper pictured here is such a bonsai, found and styled in Japan, and shaped by both man and nature. The bare, weathered trunk on the left, reduced to a fraction of its normal height, is nature's work. The green, living branches on the right have been trained into a compact, pleasing shape by human hands and pruning shears. Natural bonsai, such as this, can be awesome but they have several drawbacks. Well formed ones are scarce and difficult to come by and a high degree of skill is needed to acclimatize an old tree to a drastic change in environment. For this reason many Americans like to start their bonsai from relatively young nursery stock including container grown plants. The nursery stock is attractive, vigorous, and strong. A large selection is available in the Delaware Valley. With pruning shears and a few year's time nursery stock can be made into exhibit



caliber bonsai.

Bonsai not a small replica. The first step in pruning plant material into a future bonsai is to understand that a bonsai is not a small replica of a tree. It is only the suggestion, or illusion, of a larger tree. Even the finest Japanese bonsai are not reproductions to scale of a living tree-they only look like it. A true to scale bonsai would require leaves as small as 1/50th of an inch in some cases. Fortunately such realism is not necessary. We can create a convincing miniature image of a lovely old tree by incorporating three essential features: (1) a tapering trunk exposed to view, (2) healthy compact growth on the branches, and (3) a small container.

A trunk, broad at the base and gradually tapering toward the apex is the single most important feature of a bonsai. The human eye identifies a trunk of that shape as characteristic of a tree although it can be less than 12" high. When a stock plant can be pruned and cut back to a small tapering trunk it is well on the way to bonsai. Pruning is often drastic. All cuts whenever possible are made from the back of the tree. The side with the best view of the trunk is the front.

A student in a bonsai class recently remarked, "I know how to prune but I don't know what to prune." The group planting of Japanese maples, Acer palmatum, illustrated here shows what to prune to establish a tapering trunk. (The photograph was taken last fall after the leaves had fallen in order to show the trunk lines clearly.) The two largest trees were over five feet

continued

BONSAL

tall (the tallest one is now 30") and growing in nursery rows during early spring of 1972 when they were dug. I cut off, selectively, two-thirds or more of their top growth. Before making a single cut I examined each tree from all sides looking for a combination of trunk and branch that could be pruned to a short, tapering trunk line. I planned to remove most of the original trunk and create a new shorter trunk line with one of the upward growing branches. This was possible on the tallest tree because the top half of the trunk was originally a branch. After topping the trunk I shortened the longest branches that remained to onefifth or one-sixth the height of the trunk. Then, I removed from one-third to one-half of the root ball and repotted the trees in two-gallon plastic containers. Later in the summer, Toshio Kawamoto, the Japanese bonsai-saikei master from Tokyo, was here and combined these two large trees in a group planting with eight young maples I had been growing in containers. He planted the group as a saikei (pronounced "sigh-kay"), a style of bonsai using trees and rocks in a natural landscape. After material for bonsai is pruned to a basic trunk with pleasing branch arrangement, the rest is like trimming the tree. This year, the group of trees has sent out new growth and is already acquiring a finished appearance. With proper care and pruning the saikei will



Quince before pruning

probably be ready for display in one more year.

Key to keeping bonsai small. The second step to creating a convincing miniature image is healthy compact growth on branches around the tapered trunk. The covering can be needles or leaves, and flowers and fruits. It is a remarkable experience

to see bonsai changing with the seasons from the soft green of new leaves in spring to branches red and gold with colors of fall. These signs of life proclaim that a bonsai is a living tree. What a gift—a living tree small enough to hold in two hands.

The living covering on the branches is also the key to keeping a bonsai small. Annual pruning of new growth is the way to make a bonsai compact and well shaped. The time for the pruning varies with different kinds of trees. But if the principle is understood it is a simple matter to apply it to any species at the right time. A tree grows in layers. Each summer it sends out new shoots from last year's buds. In one year a tree can easily increase its size with new shoots one or two feet long. To keep bonsai down to size, most but not all of each new shoot is cut off, leaving only one or two buds. These buds, from the current growth, will produce new shoots the following year. That is how a tree grows; new shoots each year grow out of last year's buds. Retaining some of this year's bud for next year's growth is a must in the life of a tree.

The Chinese quince, Chaenomeles sinensis, pruned at the bonsai class at the Morris Arboretum is an example of annual pruning. A large portion of last year's shoots was removed as shown in the before and after photographs. The pruning was done in early April before the buds had opened. Several buds were left on each twig to send out replacement growth. Without regular annual pruning the quince would be a spreading bush ready for the garden instead of a bonsai container.

The direction of each new shoot can be predetermined by finding a bud located where a new shoot is desired. Prune at a point directly above that



Dorothy Young puts finishing touches to quince

bud. For example, a bud on the left side of a twig will send out its shoot to the left; a bud on the right will grow toward the right. If there is any secret to bonsai, it is this: learning how to prune to reduce the current growth each year, and where to prune to determine the direction of new growth.

Someone is probably asking at this point, "How do you prune bonsai pine? The buds are all clustered at the tip of each branch and when an old branch is pruned no new buds will form." Pines and other needled conifers require a special technique. In May, when the buds break and new growth appears, the soft shoots, or candles as they are sometimes called, can be pinched back by hand. Be careful, pinching back does not mean pinching off; it means that you remove half or a little more than half, but not all, of the candle or new shoots. Buds will form on the tip of the remaining portion. Another method is to cut back this year's shoots in June before they harden. Buds will form where the shoot is cut. Both methods work equally well but timing is critical. Pruning must be done in May or June before the year's growth has matured.

The root of the problem. To confine a tree to a small container—the third requirement for bonsai—there must be many tiny fibrous roots at the base of the trunk because a bonsai must compress a normally spreading root system into an exceedingly small space. To confine the root system, prune the tap root and all other heavy roots. Grow the tree in a

BONSAI

training pot somewhat larger and roomier than a bonsai container. The tree will form a fibrous root system directly at the base of the trunk. In the ground, the tap root serves as an anchor to hold the tree securely. The tree has no need for a tap root in a container because the fine, feeder roots are the ones that absorb moisture and nutrients from the soil. I use old pruning shears to cut roots because rough particles in the potting mix can damage the blade.

Horticulturally, a small container slows down the rate of growth and reduces the size of the leaves and needles on a tree. I am never too concerned about leaves initially being a little large because I know that after confinement in a small container for several years the tree will adjust its growth to progressively smaller leaves and branches.

Optical illusion. But perhaps the greatest effect of the container is the optical illusion it produces. A small, shallow container makes a bonsai look larger, and placing a bonsai in its own setting, apart from fully grown material, prevents comparisons. This principle of displaying bonsai isolated from distracting comparisons is used to advantage in the Philadelphia Flower and Garden Show. Every year the staging is superb. Each bonsai in its own alcove holds the center of the stage under its own spotlight. I like to exhibit bonsai at the Show because they are always displayed so effectively.

You can use ordinary garden pruning shears for most bonsai pruning provided they are the professional type with two cutting blades. There are, however, specially designed Japanese bonsai tools that make pruning easier. These shears have narrow blades for reaching through a network of branches, forged curved

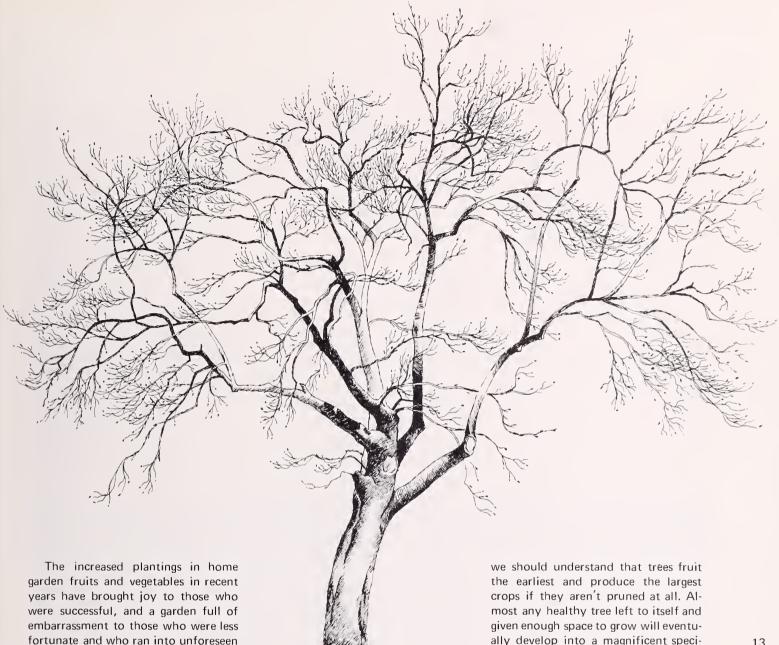


Japanese juniper



Bougainvillea spectabilis

blades for making concave cuts on heavy branches to induce rapid healing of the bark (see inside cover, third photo from left) and small scissors for delicate trimming. Regardless of the make, it pays to keep all pruning tools clean. After heavy use, I wipe them with a slightly oiled cloth. A few drops of turpentine will remove resin or other encrusted matter. When the cutting edge becomes dull I sharpen it on an oiled honing stone (a technique I learned years ago from a cabinetmaker). If you do not have a sharpening stone for your bonsai tools I urge you to buy one at a hardware store and learn how to use it. An old Chinese proverb surely applies to bonsai, "To have the job well done, first sharpen the tools."



fortunate and who ran into unforeseen problems.

Of all garden work, pruning fruit trees is considered by many people the most difficult task. But it's not complicated; it's just that many people are afraid they cause their trees unnecessary pain through pruning. And in a sense they might be right-if the job is not done properly.

To help us do the best pruning job possible, we have a very reliable assistant: the trees themselves. Who knows better how to grow a beautiful tree than the tree we are about to prune? We should ask ourselves then why we prune and how we can best do it by taking advantage of the natural growth habit of each tree.

As far as fruit trees are concerned,

PRUNING FRUIT TREES AND GRAPES

(without hurting anybody)



by Hans A. Zutter

Hans A. Zutter is associate professor of horticulture and head of the food crops science section at Temple University Ambler Campus. He has done extensive research and published articles on plant nutrition.

ally develop into a magnificent specimen. Just look at some of the many beautiful old apple trees that can be found in the Delaware Valley area. Most of these trees haven't been pruned for decades. Any corrective work necessary to make such old trees more manageable should be left to professional pruners.

Home gardeners should start pruning when a tree is planted. To make the job as painless as possible to both the tree and the novice pruner, let us consider why we prune. A young fruit tree left without pruning for a number of years will grow tall and out of reach. As the tree begins to bear fruit, grows older, and produces ever heavier crops the tall branches may bend and break. We prune therefore to keep the continued

drawing by Julie Baxendell

branches short and strong.

Fruit trees develop a fairly thick canopy of leaves if they are not pruned. The leaves produce food for the fruits to grow and develop their seeds, which is just fine for the tree. The leaves also keep the sun out of the center of the tree, so that the fruit will not turn fully red when it is ripe. A tree with a very thick canopy of leaves is also difficult to spray, and insects and diseases cannot be easily controlled. We prune the tree to keep the top open.

We have now three reasons for pruning a fruit tree: to keep the tree low, to make the branches strong, and to keep the top of the tree open. An experienced pruner will accomplish these three goals with very little damage to the tree and with little frustration to himself. He will prune as little as possible, for with each pruning the fruiting of the tree will be delayed, and the crop will be reduced.

Before we get the pruners and saw out, let us briefly consider which part of the tree produces the leaves, and which part produces the fruits. On apple and pear trees the longish annual growth of twigs produces only leaves. Farther inside the tree, toward the older part of the branches, short fruiting spurs develop which carry flower buds at their tips and produce the fruit. The fruiting spurs, from which all apples and pears come, grow less than an inch per year, and have rosettes of leaves during the summer, Enough spurs must remain on the tree after pruning to allow for a good crop of fruit.

Peaches and nectarines fruit only on the previous year's growth of twigs at and near the younger part of the branches. When pruning these trees we must leave enough twigs to permit a sufficient amount of fruit to be produced each year.

apples and pears

We are now ready to prune a tree. Let's start with a young apple or pear tree fresh from the nursery. We may have a one-year-old whip, which has no side branches. It may be three feet to five feet tall; cut it back to about 30 inches. One cut will do that. That is all there is to it. Stop.

Two-year-old trees, either bought

at a nursery or planted as a whip the previous year, have grown a number of small side branches and one or two upright leaders at the top. First remove one of the upright leaders if there are two. Next locate two or three side branches along the trunk of the young tree. These branches should face in opposite directions, starting at about 18 inches off the ground, and should be 18 to 24 inches apart. Cut off all other branches close to the trunk. Stop right here, and don't cut off the tips of the remaining branches.

All subsequent pruning consists of a few simple annual corrective measures, making as few cuts as possible. All branches coming from the main trunk should be spaced about 24 inches apart and should face in different directions to produce a well balanced tree. After a few years, when the tree is tall enough, the central trunk is cut back to a convenient side branch to keep the tree from getting too tall. Any watersprouts (suckers) coming from this cut are removed annually and the tree is not permitted to grow any taller.

The side branches themselves are cut back every year or two to make them a little shorter and sturdier. Branches that grow stronger than others should be cut back a little more than the weak ones, to always produce a well balanced tree.

As the tree grows older, it will become necessary to thin out any branches that are too dense. The thinning is easily accomplished by cutting out branches that cross and rub each other, branches that grow into the center of the tree and watersprouts.* Fruit growers have a saying that one should be able to throw a cat through an apple tree after it has been pruned. Think about that one, but please don't try it.

peaches

Peach and nectarine trees always have side branches by the time they are bought from the nursery. After planting a young tree, cut it back to a good side branch about 30 inches above the ground. Remove all but four branches facing in four different directions, the lowest one about 18 inches above ground. These four branches will



Fruiting of apples and pears occurs in the inner part of the tree. The short spurs produce flowers and fruits, the long twigs produce only leaves.

be the future framework of the tree, which will be trained in an open cup or vase form, rather than the central leader style used for apples and pears.

Every year the four branches should be cut back by about one half their annual growth. The pruning will make them strong and encourage the vigorous growth that produces the peaches. Any strong shoots that interfere with the tree's basic cup or vase shape should be removed annually, and the height of the tree should be limited to whatever seems convenient to handle, perhaps eight or ten feet.

Recently I heard a recommendation for pruning mature peach trees which I really shouldn't pass on but maybe it is too good to keep to myself. Well, here goes my reputation as a pruner: first cut off all dead and broken branches. Next cut back from the outside about half of what is left of the tree. Then cut off half of what is still left from the inside. Don't forget to fertilize the tree early next spring. Please do be careful if you try this method!

grapes

Grapes need more severe pruning than any other fruit plant growing in

our part of the world. We do all this pruning mainly for our own convenience in handling the plant. A healthy grape vine will easily grow 30 feet in one growing season. If unchecked, the vine will soon grow over trees and shrubs and buildings and over your good neighbor's garden.

Any kind of pruning that keeps the grape vine from growing all over the place would be satisfactory, provided enough one-year-old canes are left on the plant to provide a good crop.

As a matter of convenience most grapes in home gardens are pruned according to the single trunk four cane Kniffen system. This pruning system is completely mechanical and can be done by anybody. First you need a trellis with a strong (No. 9) wire about 24 inches above the ground and a second wire of about 60 inches above ground. The grape plants are spaced about 15 feet apart along this trellis.

The vine is first trained straight up to the top wire and securely tied in place.

As soon as possible, one cane from the previous year's growth is tied to each wire left and right of the plant, making it look like a capital T with an extra cross bar in the middle. The four canes should come directly from the trunk of the plant and should be cut back to 10 buds if they are too long.

Next to each cane one short stub (renewal spur) is left on the trunk; cut back to two buds. This should be done in early spring. During the summer every bud of the canes and renewal spurs will produce shoots and fruit.

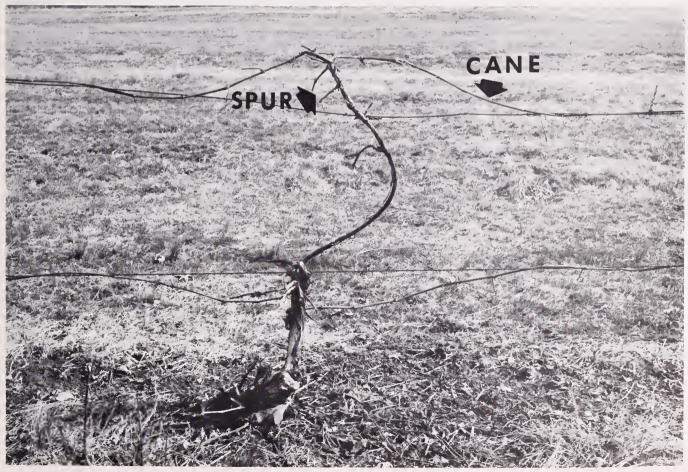
The following spring four new canes are selected from the renewal spurs, pruned back to ten buds, and tied to the wires. Four renewal spurs are also left and everything else is cut off. We have now an alternating system of four canes and four renewal spurs, two of each for each of the two wires. As the

canes fruit, each renewal spur produces one or two shoots, the strongest of which will serve as next year's cane. Conversely, each one of the four canes will provide a new renewal spur. The trunk of the grape stays the same and may last for over a hundred years.

Something should be said about the time of the year to prune trees. Almost all pruning is done during late winter and spring, because the trees have no leaves at this time and the fruit growers have little other work to do. For many years horticulturists have known that it would be much better if fruit trees were pruned in May, June, or July, because pruning wounds would heal much faster at that time of the year. So you have your choice of pruning times.

Let me close with one important piece of advice. If you aren't sure whether you should make a major cut on a tree, don't make it. It can wait until next year.

A properly pruned grape is not always a thing of beauty; all that is left are the trunk, four canes, and a few renewal spurs.

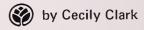


Cecily Clark exhibits dwarf myrtle (Myrtus communis microphylla) topiary. The topiary won three top awards at the 1972 Harvest Show: one from PHS for the best exhibit in the horticultural section, and two from the Garden Club Federation of Penna.-the overall best horticultural specimen in the show and an award of merit.

photos by Edmund B. Gilchrist, Jr.



nail scissors for pruning?



Cecily G. Clark won 14 awards for her 15 exhibits at the 1973 Philadelphia Flower & Garden Show: five blue ribbons, four seconds, three thirds and two honorable mentions. She was chairwoman of the Show's competitive classes in 1971 and 1972.

Despite the fact that we own a collection of well designed clippers and scissors, the instrument I most cherish for pruning is a stained and battered pair of nail scissors. Using nail scissors to prune is not what the rest of this issue of The Green Scene is all about; but it will give some idea of the painstaking care needed to maintain a container grown topiary. In addition to the nail scissors, my tools of the trade are a long-handled pair of scissors and extra length tweezers. The long scissors and tweezers are invaluable for reaching into otherwise inaccessible parts of the plant.

The commitment explicit in undertaking to grow and care for a trained plant involves a number of decisions as well as sheer bravado.

size, shape and design

The first step in starting a topiary is to establish size, shape and design; next you should decide what kind of a

plant you want to use. Rosemary (Rosmarinus officinalis) or the prostrate form (R. prostratus) is reliable, and because the foliage is so fragrant, they are a joy to prune. The plant's culinary uses are a further consideration in their favor. Dwarf myrtle (Myrtis communis microphylla) is a popular and satisfactory subject although it needs pruning much more often than rosemary. The shiny dark green leaves give it a brilliant, almost unreal appearance. The small-leaved scented geraniums (Pelargonium crispum) or the variegated-leaved one (P. crispum variegatum) is very attractive and, like rosemary, they are fragrant. I find they are less pleasing in the house in the fall months because they drop a lot of their leaves, but they flourish outdoors in the summer. The handsome Surinam cherry (Eugenia uniflora) [see page 24 The Green Scene-January/February issue] and Cuphea hyssopifolia are two less usual plants that can be used for

topiaries. Another is ivy, in all its varieties. Greenhouses and topiary exhibits in flower shows are excellent sources for ideas.

Since this article centers on pruning topiaries, I'm not going to get into the intricacies of getting the plant and the form into a pot except to say that for the uninitiated it can be a perilous procedure and should not be attempted without guidance. Your plant material may be a rooted cutting or a more mature plant, the shape of which lends itself to the selected form. Sometimes it can be the other way around; a good design will be suggested by the shape of the plant. Whatever the case may be, it's important that the plant and the form be firmly established, close together in the pot, and securely attached to the form with soft string. Work from the base up and keep the points at which the plant is tied to the form close together; the ties should be about 1½" to 2" apart. If the plant is mature,

continued



Cecily Clark prunes a dwarf myrtle.





the first step after the obvious branches are tied to the form, is to prune away superfluous side shoots that do not lend themselves to the basic design. A cutting can be guided along the main stem, allowing side shoots to grow out where needed to complete the design.

working with the form

Cut the stakes for a standard to the height you want the plant to grow; the stakes should be permanent, made either of heavy wire or a curtain rod. Attach a corkscrew of heavy wire to the stake; bend it so it fits inside to the bottom of the pot; the plant's roots

will grow around the wire and keep everything steady. This method is good for all topiaries. Starting at the bottom, tie the main stem securely to its support; allow it to grow until it reaches the top of the stake. Don't prune the leaves attached to the main stem. They are needed for the natural growth of the plant. But do prune off any side shoots that form up to the point on the stem where the head is to be developed. Some side shoots should be allowed to grow out while the leader continues to grow up. When the top of the stake is reached, the top of the leader should be cut off and the termi-

nal leaves of the side shoots continually clipped to encourage more growth. The lower leaves on the stem may then be removed.

In due course there will be an everwidening tuft of growth towards the top of the plant. It won't look like much for a long time; it may be two years before there's anything to be proud of, and closer to three before it's finished. But the fact that it grows and fills out at all is what makes it so fascinating. The pruning in the early stages will not occupy too much time, but it is important to "tip" it as often as possible-that is, snip off the terminal set of leaves on every branch, keeping in mind that, right from the start, the tuft at the top should be as round as possible.

In many ways the pruning is like sculpture, one has to "think round" as one prunes. As the ball of growth gets larger the pruning sessions will last longer, and it will be tempting to "take the shears to it." But as one exhibitor said, "All you get when you shear is dead-end Charlies." The point is that any shoot that is cut between the axils out of which the new set of leaves grow will stop making new leaves. The growth of the plant will be more even and thicker if each branch is trimmed separately and always back to the axil. Another reason not to shear is that it inevitably slices the foliage and spoils its appearance. Tipping and pruning back to the axil, time consuming as it may be, forces new growth and insures a smooth neat appearance.

Once the ball of growth is fully developed, or even before, it's possible to add a second or a third shape that appeals, but keep an overall proportion in mind as the form develops. (The standard in the illustration was done this way. The top two tiers were added as an afterthought.) A few shoots are allowed to grow up and out and are gradually pruned into shape using the method just described.

other designs

To start a topiary in the candelabra design, or one similar to it, the main stem is tied to the vertical line. When a side branch develops at the points where the horizontal lines meet the vertical, start tying that branch down encouraging it to grow across the form. Meanwhile pinch or tip side growth on both the vertical and the horizontal lines to force the design to fill out where the leaders, growing in both directions, reach the end of the form.

There will be bare spaces that seem to take an endless time to fill in. Regular pruning will force new growth and often this growth can be tied down to

the form if it appears in the right place. In container grown topiary, tying down can also be considered pruning since visually at least it removes undesirable growth. While such growth is still soft. bend it gently against the form being careful to tie it in such a way that foliage isn't caught in the ties; foliage pressed against the form and against other leaves will probably not survive. Growth tied down in an obvious way tends to spoil the plant's overall appearance. Check ties to make certain they aren't too tight. As the stems increase in size the original ties may cut right through them. Clip away the strings and where necessary tie again. As woody plants develop they begin to hold their shape without too much support. Some growers develop the design with a support and eventually remove it. In the case of ivy and other types of material that are essentially vines as opposed to woody material, the pruning is largely a matter of tying down new growth. Foliage is removed when it is oversized, atypical of the variety, interferes with the even appearance of the design, or is yellowed or damaged.

grooming for show

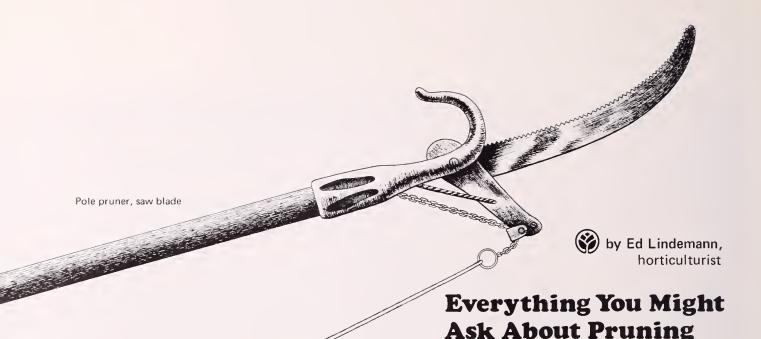
You should be grooming a topiary for a show all year-round. That's true of any plant, but topiaries take longer to care for than most. I spend a lot of time pruning and snipping in the summer when the plants grow most. They get out of hand when we're away and require major repair when we come home. They thrive, however, on the terrace sunk into a bed of pebbles while we're gone. I bring them in in the fall well pruned and in good condition. From this point on, they rest, and as far as they are concerned so do I. I have learned, though, that if they are to be in shape to exhibit in the Philadelphia Flower & Garden Show, serious work must begin on them before Christmas. They will have dropped a lot of leaves and their growth is weak-looking and uneven. I first trim in early December. Don't ever attempt to do a complete pruning job at the first sitting after a plant has been neglected for awhile; that applies in the summer too. One's interest flags and may never return. Finish the pruning gradually in several short sessions, cutting off the longer shoots, and tipping the others to encourage growth.

Turn the plant over on its side on some newspaper and shake it, using your hands to gently dislodge dead foliage which accumulates in the hundreds of branches that form the design. Keep turning the plant until as much refuse as possible has been removed. What remains can be loosened, using the eraser end of a pencil, or long tweezers. The long-handled scissors can be used to prune out dead twigs. Removing such material provides good circulation and helps to prevent disease. In the summer, remove accumulated refuse by laying the plant on its side and spraying it from the bottom with the hose.

The Christmas deadline for clean-up, regular feeding, daily syringing, and frequent pruning should give the plant enough time to develop so that it will show shape in March. You may get as many as one hundred clippings in one pruning session for an average sized dwarf myrtle topiary. Rosemary, which grows slowly, doesn't need to be pruned as often.

Pruning will be a lot easier if you raise the plant to eye level while working. Stand back frequently, look at the silhouette, turn it, and study it from all angles. It's easy to become so intent on one section that the overall effect becomes unbalanced. I'm often reminded of the man who could never get his sideburns even. It's exasperating to discover as you slump into a chair, refreshment in hand, after an intense session of shaping that your masterpiece is clearly lopsided.

For anyone who likes the feeling of getting close to a plant, it will never be more so than when taking care of a container grown topiary.



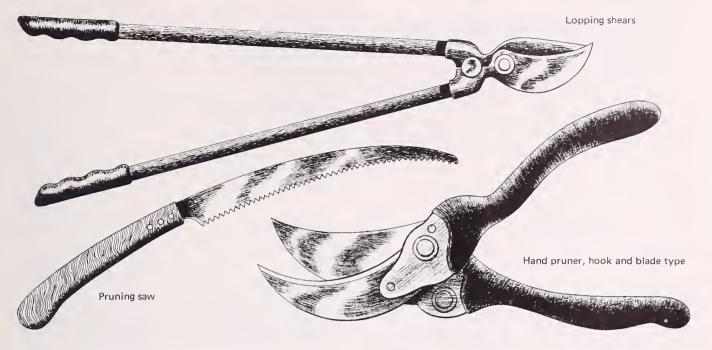
pruning tools

- Hand pruning shears. Used for pruning cuts up to one-half inch in diameter. Do not try to cut through any material that requires using both hands to make the cut. There is no significant difference between the hook and blade and anvil type pruner. Some people find one type more comfortable than the other.
- Hedge shears. Select a hedge shear that has a shock absorber between the handles; the absorber may be made of rubber, a spring or some other material. Use only for pruning formal hedges, either deciduous or evergreen.
- **Lopping shears.** They are especially designed with 20- to 30-inch handles to provide added leverage. Used in pruning jobs with a cut ranging from ¼ inch to 1 inch in diameter.
- Pole pruners and saws. Telescoping aluminum poles seem to be the most preferable because they are lightweight and therefore less exhausting to use. AVOID WORKING NEAR ELECTRICAL WIRES WHEN PRUNING OR SAWING WITH A POLE PRUNER. Most pole pruners will handle a cut up to one inch in diameter; many have an adaptable saw that can be used for cuts larger than one inch in diameter.
- Pruning saws. Use a pruning saw for cuts over one inch in diameter. Pruning saws are designed with special teeth that are wide enough and coarse enough to prevent gumming from moist sawdust.

pruning glossary

- Alternate bearing. Some plants that bear fruits and flowers more heavily one year than the next. (Ex. mountain laurel.)
- Alternate branching. Branches that appear alternately from the main stem or trunk and give a balanced look to the plant.
- Axil (leaf axil). The angle found between the main stem and

- the leaf stem. Lateral and axillary buds are found in the axil angle.
- Bleeding. Refers to the flow of sap when a plant is cut. Some plants that bleed excessively may be called bleeders. (Ex. birch.)
- **Brushing out.** Removal of brush-like growths from trees and shrubs.
- Buds. All vegetable and flower growth starts as buds, either terminal, axillary or lateral. Terminal buds are found on the end of all shoots. Axillary buds are found in the axil area. Lateral buds are found along the branch below the terminal bud; they may either be arranged alternately or oppositely.
- Cambium. A thin layer of tissue found between the bark and the wood.
- Cane. Refers to the long vigorous stems that grow from the ground up rather than branching from another stem such as the cane of a rose shrub or a raspberry bush.
- **Cordon.** A European method of training fruit trees to a single main stem with lateral shoots carefully pruned. A cordon may grow either vertically or horizontally.
- Crotch. The angle between the trunk and a branch or a grouping of two or more trunks. A "U" shaped crotch is much preferable to a "V" shaped crotch when pruning.
- **Disbud.** The process of removing buds so that the plant energy can be concentrated on one or more remaining buds. It usually results in a more spectacular bloom.
- Espalier. The art of training a plant to grow flat either against a wall or a fence.
- Lateral. Pertaining to the side; a lateral bud is found on the side; a lateral branch is a side branch.
- **Leader.** The principal central branch of a plant that always goes up.
- Pinching. Practice of removing the tips of branches while the



growth is still soft by using the thumb and forefinger. It usually results in a bushier growth habit.

- Selectively. The opposite of shearing. To prune selectively means only to remove the parts that you do not want to keep.
- Standard. A plant that is trained into a tree-like form with a single upright trunk and rounded crown.
- Stub. An unnecessarily long section of a branch or stem that has been left between the pruning cut and a bud. When a stub is left it will usually die back to the next bud and is an excellent area for decay and disease to set in.
- Suckers. Unwanted shoots that may appear on any part of the plant. Sucker growth is usually vigorous and often overtakes the established branches.
- Thinning. The process of removing entire branches clear back to the main trunk or side branch.
- **Topiary**. The art of shaping trees and shrubs to unnatural shapes.
- Water Sprout. See definition of suckers.
- Winterkill. Sudden extreme changes in temperature, particularly a very low temperature or wind, that may kill a plant or part of it.

when to prune

Knowing when to prune is one of the most important factors in the pruning operation. You should know the flowering and fruiting habit of the plant before pruning; otherwise you may damage the plant irrevocably.

Listed below are some guidelines for "when" to prune, prepared by the Indiana Cooperative Extension Service, Purdue University.* The list is from *Pruning Ornamental Trees & Shrubs*, included in their Communikit series. The Communikit is available for rent for \$12 from the PHS Library; it includes slides and a reel, cassette or script for audio.

*Reprinted with permission from the Indiana Cooperative Extension Service, Purdue University.

- 1. Trees and shrubs that flower before the end of June should be cut back or pruned immediately after flowering. Flower buds have developed during the previous season's growth. Thus, the flowers for this year's bloom were developing last summer, and overwintered in a very small form as a bud. If pruned before flowering in the spring, all of the flower buds would be removed, thus eliminating flowers for this season. Examples of the early flowering plants are shown in Table 1.
- Trees or shrubs that flower after the end of June should be pruned in the winter or spring before the new growth starts. These plants develop their flower buds during the spring growth of the season of flower. Examples are shown in Table 2.
- 3. Certain trees and shrubs may be lightly pruned both before and after flowering. This often increases the bloom and fruit production, and several may also produce a second bloom during the year. Examples are shown in Table 3.
- 4. Shrubs or trees that are prized for their fruit should be pruned after the fruit drops. Examples are certain viburnums, European mountain ash, and hawthorn. They may flower early in the season but the fruit must be allowed to develop. After the fruit has lost its appeal, pruning may be carried out.
- 5. Evergreens, both broadleafed and narrowleafed types, may be pruned anytime the wood is not frozen. Evergreens may be pruned for Christmas decorations with no danger of injury to the plant. The new shoots of a coniferous (narrowleaf) tree should be pruned back annually if you want a compact plant, or have to control its size. Narrowleafed evergreens will not develop new shoots on the older wood, so don't cut beyond the living foliage portion of the branches.
- 6. Some deciduous trees, known as "bleeders" due to the heavy flow of sap in the early spring, may be pruned in the summer or fall. This is satisfactory if sap dripping

continued

from wounds is objectionable falling on the sidewalk, parked automobiles, or on the house. The loss of sap due to pruning will not injure the tree, and fall pruning should be carried out only if the dripping sap is objectionable. Trees that fall into this category are maple, birch, dogwood, elm, walnut, and yellow-wood.

7. Avoid late summer pruning in August through mid-September. Pruning at this time of the year encourages new growth to develop which will not harden sufficiently for the winter, thereby increasing the danger of winter damage.

TABLE 1. Spring flowering trees and shrubs which should be pruned after flowering.

pruned after flowering.		Abelia grandiflora Acanthopanax	Glossy abelia Aralia
Scientific Name	Common Name	Albizia	Silk tree
Scientific ivallie	Common Name	Buddleia	Butterflybush
		Callicarpa	Beautyberry
Amelanchier	Shadblow	Clematis	Clematis
Azalea	Azalea	Hibiscus syriacus	Shrub-althea
Berberis	Barberry	Hydrangea paniculata 'Grandiflora'	P. G. hydrangea
Calycanthus	Sweetshrub	Hydrangea quercifolia	Oakleaf hydrangea
Carangana	Peashrub	Koelreuteria paniculata	Goldenrain tree
Celastrus orbiculatus	Bittersweet	Rosa	Hybrid tea
Cersis	Redbud		
Chaenomeles	Flowering quince		
Cornus florida	Flowering dogwood	TABLE 3. Trees and shrubs which	n may be pruned both before
Cornus kousa	Kousa dogwood	and after bloom.	i may be pruned both before
Cornus mas	Cornelian cherry	and after bloom.	
Cotinus coggygria	Smoketree	Scientific Name	Common Name
Crataegus	Hawthorn	ocientine italie	Common Name
Deutzia	Deutzia		
Forsythia	Forsythia	Cornus stolonifera	Red Osier dogwood
Kalmia latifolia	Mountain laurel	Cotoneaster apiculata	Cranberry cotoneaster
Kolkwitzia amabilis	Beautybush	Cotoneaster divaricata	Spreading cotoneaster
Ligustrum	Privet	Cotoneaster multiflora	Multiflora cotoneaster
Lonicera	Honeysuckle	Mahonia aquifolium	Oregon hollygrape
Magnolia	Magnolia	Spiraea bumalda	Anthony Waterer and
Malus	Crabapple		Frobel spirea
Philadelphus	Mock orange	Symphoricarpos albus	Snowberry
Pieris	Andromeda	Symphoricarpos chenaulti	Chenault coralberry
Prunus	Flowering cherry and plum	Weigela florida	Rose Weigela
Pyracantha	Firethorn		
Rhododendron	Rhododendron	11 - 1	The state of the s
Rhodotypus scandens	Black jetbead	Hand pruner, anvil type	THE STATE OF THE S
Rosa	Climbers and shrub roses		
Sorbus	Mountain ash		alle He K liftur.
Spiraea thunbergii	Thunberg spirea	金 ()	
Spiraea vanhouttei	Vanhoutte spirea		
Styrax japonica	Japanese snowball		To The Control of the
Syringa	Common, Chinese, and		think his waster or
	French lilacs		A Minute and Supplied and the

Scientific Name

Viburnum burkwoodii

Viburnum plicatum tomentosum

Viburnum carlesii

Viburnum lantana

Viburnum opulus

TABLE 2.

Scientific Name

Abelia grandiflora

<u>classified</u> ads

TERRARIUM PLANTS and supplies, kitchen HERBS and some unusual perennials. See our antiques, reproductions and gifts. Come browse—it's FUN!—The Country Cupboard, Routes 202 and 263, Buckingham, Pa. Phone 794-8645.

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Polly Fairman's Indoor Bonsai Greenhouse and Japanese Gardens, 103 Mt. Lucas Road, Princeton, New Jersey 08540. By appointment. 609-924-3202. Indoor Bonsai a specialty. Gifts for plant loving friends and relatives. Supplies, planters. Saturday morning workshops and clinics for all Bonsai problems. Grooming and boarding. Japanese landscaping. Lectures for garden clubs at Poly-En Gardens.

Horticultural student will tend plants and pets in Chestnut Hill, Roxborough area while you're away during June and July. Call CH 2-3016.

Available space in cool greenhouse, Sept. through May, 1973-74 in Three Tuns, Ambler. For more information, call MI 6-7526.

Common Name

Wayfaring tree

Common Name

Glossy abelia

Summer flowering trees and shrubs which should be

pruned before spring growth begins.

Burkwood viburnum

Doublefile viburnum

Korean spice viburnum

European cranberrybush

Advertising copy should be submitted 8 weeks before issue date: November, January, March, May, July, September. Minimum rate \$5.50 (covers up to 35 words). Additional words 20¢ each. Less 10% discount for two or more consecutive issues, using same copy. All copy should be accompanied by check made out to PENNSYLVANIA HORTICULTURAL SOCIETY and sent to Patricia M. Cain, THE GREEN SCENE, 325 Walnut Street, Philadelphia, PA 19106.

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Franklin H. West is a psychiatrist who spends his leisure time gardening. He has an extensive collection of azalea and rhododendron. Dr. West is a member of PHS and the American Rhododendron Society; he is a member of the board of The Tyler Arboretum.

pruning rhododendrons

Prune rhododendrons? Many gardeners answer with an automatic "No!" or "Never!" even though they may be familiar with the fact that nature uses at least five tools to prune these plants in the wild: fire, deep freeze, fungi, flowering, and sunshine. The trick is to adapt these tools for use in our own gardens.

Fire literally cuts these plants to the ground. A year later, most plants are being replaced by compact regrowth springing up from the base of the burned stalks. Rhododendrons apparently killed by freeze damage may similarly rejuvenate. Branches killed by the die-back fungus are usually replaced by new growth from below the blighted tissue.

The secret? Rhododendrons carry in their bark myriads of latent buds, one above each old leaf scar. The buds will spring into life if the branch beyond that particular bud dies. Pruning initiates the same process, particularly when it is done just before the first spring growth of the plant. March and April are the ideal times to prune these plants in the Delaware Valley, but pruning anytime between dormancy in November and the following May will produce good results. If your rhododendron has grown too large or tall for its site, cut back one-half of the stems to the desired height this year, and the remaining ones next year. This alternate year pruning avoids excessive shock to the plant as well as unsightliness during the rejuvenation process.

To improve the shape and fullness of small or spindly rhododendrons, disbud the terminal growth buds just as they swell in the spring. Disbudding forces the buds in the leaf axils just below the removed bud to swell into growth, so that two, three, or four shoots replace the one removed. Nature does this kind of pruning on older plants; flower buds cause their branches to behave as if they had been disbudded. Removing dead flower trusses is not necessary to initiate the process, but may be helpful in favoring flower bud production for the following year. This type of pruning is called "deadheading."

Sunlight decidedly influences the bushiness and height of rhodo-dendrons; lack of it favors spindly, leggy growth. Bushiness, flowering, and disbudding will all be more successful if your plants receive some sunlight each day. Pruning overhanging tree branches and selective tree removal is the most important part of your rhododendron pruning program. The objective is to give the plants sunlight for at least 20% of the daylight hours. The best results occur when the sunlight factor is from 20% to 40% of daylight hours.

Franklin H. West, M.D.



Jerry Abrams is superintendent of the Morris Arboretum in Chestnut Hill. He received an M.S. in ornamental horticulture from the University of Delaware. Abrams designed the Morris Arboretum exhibit for the 1973 Flower & Garden Show.

pruning flowering shrubs

Pruning flowering shrubs—philadelphus, Iilac, wisteria, forsythia, hydrangea, and beauty bush—is frequently done improperly and at the wrong time of year. The problem of when to prune flowering shrubs is generally simplified by the following rule: if the shrub flowers before June 30, prune immediately after flowering; if the shrub flowers after June 30, prune during the winter or early spring before growth starts. The question of how to prune becomes a little more complicated. Start by removing dead, diseased and damaged branches. Remove growth that is weak and thin. To encourage new growth on the inside of the plant, cut the branches at varying lengths. Also remove some of the older wood, that will encourage new growth which will keep the plant healthy and vigorous. To encourage plump flower buds the following year, remove all dead flower heads and old shriveled fruit clusters.

Many older shrubs must be rejuvenated. This process is done over a three-year period. During the first year remove 1/3 of the old wood and reduce the length of the new growth by about 1/3 to 1/2. The following year remove another 1/3 of the older wood. Remove also thin weak branches and again reduce the length of the new growth. During the third year remove the final 1/3 of the old wood and prune as you would a normal flowering shrub. By following these steps for pruning flowering shrubs, you can add years of beauty and enjoyment to an otherwise declining specimen.

Jerry Abrams

pruning clematis

Pruning clematis correctly depends upon the class to which it belongs and hence its blooming season. Essentially, clematis that blooms in spring and early summer should be pruned after flowering. Those that bloom later should be pruned in early spring and may be pruned hard. Should you not be sure of what you have, check a garden book or reliable catalog.

The Jackmani and Lanuganosa hybrids, which include most of the large flowered kinds, bloom on growth of the current season. They should be pruned as soon as green begins to show on the leaf buds, usually in early March. Severe pruning, cutting all stems back to 18 inches, will often produce larger, finer flowers, but fewer of them. And, the clematis can be kept in bounds with flowers more nearly at eye-level. When the Lanuganosa hybrids are cut back this way, blooming is delayed until mid-summer when their show may be more appreciated. Pruning by thinning out 1/3 to 1/2 of the stems is also practical. Cut them back to just above two leaf buds about one to two feet high.

Early flowering kinds of the florida or patens classes should only be thinned; don't prune them hard unless they get out of control. Remove small weak stems and other necessary pruning in early summer after they have bloomed.

Late summer flowering clematis should be pruned in spring. Thinning weak and spindly growth is all that is needed, but hard pruning can be done.

A little time training clematis when it is growing rapidly in spring is well spent. Keep the growing ends separated and fan them out on a trellis or wire support. As with most gardening, a little timely effort training and trimming will make your clematis a showpiece.

Richard Hutton

pruning garden roses

Pruning hybrid tea, floribunda and grandiflora roses is best done in early April before the buds have started into growth. Methods can vary from light to severe pruning.

Before pruning hybrid tea roses I study each plant separately. I decide which canes I want to leave on the plant. That means selecting three to five of the healthiest and thickest of last year's canes coming from, or near, the base of the plant. I cut them back to about 15 to 18 inches from the ground. The height can vary greatly depending on the vigor of the plant, the winterkill that might have occurred, and the individual varieties. A clean, slanting cut is made one-fourth inch above an outward-pointing bud. Everything else on the bush is cut out at the base of the plant. Thus all thin, diseased, broken and winterkilled canes are eliminated; what remains are a few vigorous canes to produce the best flowers.

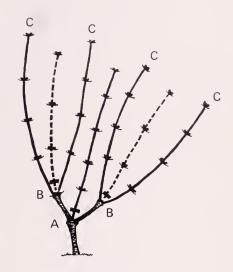
Grandifloras can be pruned similarly. With some vigorous varieties, such as Queen Elizabeth, more canes can be selected and cut lightly.

The habit of the many floribunda varieties varies greatly from dwarf, compact to tall and bushy making them appropriate for various land-scape uses. To prune these follow procedures similar to those described above, or shape to conform to where they are growing, cutting out about two-thirds of the old growth.

To remove old blooms during the summer, cut back flowered canes with sharp shears to one-fourth inch above the first full leaf. The bud in the axil of that leaf will be induced to grow and produce another flower in a few weeks. Since leaves are needed to manufacture food, which produces a better root system, more top growth and more and better quality flowers, do not cut off any more leaves than necessary.

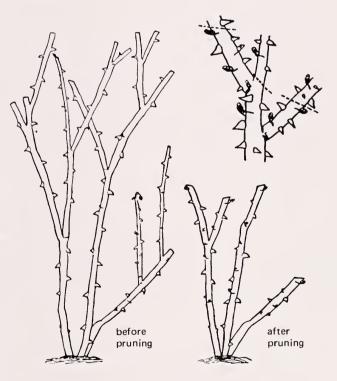
In the late fall cut back tall canes to about four feet to prevent winterkill.

Viola K. Anders



- A, first-year shoots.
- B, second-year shoots.
- C, third-year shoots.

Richard Hutton, more closely associated with roses, is a truly amateur gardener away from his duties with The Conard-Pyle Co. Clematis has been an avocation, which climaxed when Star Roses staged a sensational Flower and Garden Show display of them a few years back.



Viola K. Anders has been an instructor in floriculture in the department of horticulture at Temple University, Ambler Campus, for 19 years. She is also responsible for Ambler Campus's flower gardens. Ms. Anders graduated from the Pennsylvania School of Horticulture for Women in Ambler.



A well-formed branch. The proliferation of twigs is the result of several years of careful pruning.